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A RECORD OF

CONTRIBUTIONS

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UNION OF SOUTH AFRICA

PRETORIA

IMPERIAL MYCOLOGICAL INSTITUTE
19 JULY 1938

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SOUTH AFRICAN ASCOMYCETES IN THE NATIONAL HERBARIUM.

By ETHEL M. DOIDGE.

PART IV.

136. **Vestergrenia chaenostoma** (Sacc.), Th.

Ann. Myc. XVI (1918), pp. 178–179.

Syn. *Physalospora chaenostoma*, Sacc. Hedw., 1899, p. 132; Syll. Fung. XVI, p. 460. *Haplodothis chaenostoma* (Sacc.) Th. Verhandl. K. K. zool. bot. Gesellsch. Wien., 1916, pp. 296–400.

On the leaves of *Maesa* sp., Durban, Natal; on *Maesa rufescens*, Zoutpansberg, leg. Pole Evans.

On leaves of *Maesa rufescens*, Durban, Natal, Medley Wood (Wood No. A. 86) [835] and [11136]; Winterskloof, Natal, 27.6.11, Doidge [1621]; Windy Hill, Natal, 9.9.13, Van der Bijl [6955]; Eston, Natal, 14.12.13, Van der Bijl [8372]; Maritzburg, Natal, 10.6.14, Doidge [8397]; Buccleuch, Natal, 20.4.16, J. M. Sim [10147]; Louis Trichardt, 8.4.19, Putterill [11839]; Claridge, Natal, 15.7.21, Doidge [14946]; Town Bush Valley, Maritzburg, 9.2.22, Doidge [15415].

Epiphyllous; the perithecia are closely crowded in groups 5–8 mm. in diameter, these groups often coalescing to form larger groups. Perithecia sunken under the epidermis, but protruding somewhat, the covering layer early becoming ruptured and wide open. The wall at the base and sides of the perithecium is comparatively thin, 8–10 μ thick, consisting of a few layers of fuliginous brown, elliptical cells. The outer wall is thicker, forming a flat, broad covering layer 30–40 μ thick and 150–180 μ in diameter, parenchymatous in structure. There is no typical ostiole. The whole pseudo-perithecium is 200–220 μ high, 240–260 μ diam., flattened-spherical in form. It does not reach the lower epidermis, the upper epidermis becomes ruptured by the pressure of the perithecium. There is no true stroma.

The asci are very varied in form; some broaden out from a short foot and are clavate, up to 130 μ long × 24 μ broad in the upper part; others broaden suddenly from a long thin stalk 50–60 μ long; these are cylindrical, 65 μ × 34 μ. The asci are eight-spored, and there are no paraphyses.

Spores hyaline, one-celled, oblong, straight or somewhat narrower in the lower half, both ends broadly rounded, 25–29 μ × 9–11 μ.

137. **Pleomassaria gigantea**, Syd.

Ann. Myc. XII (1914), p. 265.

On rind of *Euphorbia* sp., Amanzimtoti, Natal, 10.7.11, Doidge [1660]; 20.5.13, Doidge [6625].

Perithecia scattered, globose or hemispherical, coriaceous-carbonaceous, about 1 mm. diam., black, covered, immersed in the cortex, with a round ostiole. Asci oblong, 200–300 μ × 35–40 μ, 1–2-spored; paraphyses very long and extremely numerous, 1–1½ μ thick. Spores oblong or oblong-fusoid, blunt at both ends, transversely 18–30-septate, not constricted or slightly constricted at all the septa, sometimes with a more decided constriction at the medial septum, longitudinally 3–5-septate, and thus

becoming muriform ; at first hyaline, then olivaceous- or reddish-brown, 80–170 μ × 25–28 μ. The spores seem to have a delicate mucilaginous envelope ; in the original description Sydow states that he has not observed this.

138. **Titanella grandis,** Syd.

Ann. Myc. XVII, p. 36 (1919).

Syn. *Pleomassaria grandis,* Syd. Ann. Myc. XII (1914), p. 264.

On bark of *Sideroxylon inerme* L., Amanzimtoti, Natal, 20.5.13, Doidge [6622].

Perithecia scattered, flattened-globose, 1½–2½ mm. diam., black, immersed in the outer bark with the upper part protruding, ostiole round, comparatively small, walls very thick ; asci variable, 2–8-spored, indistinctly paraphysate ; spores monostichous to distichous, ellipsoid-oblong, obtuse at both ends, transversely 10–15-septate, longitudinally 2–4-septate, not constricted or rarely very slightly constricted at the medial septum ; at first hyaline, then fuscous, 70–95 μ × 28–36 μ, epispore 2–3½ μ thick, spores immersed in a mucilaginous envelope.

139. **Pleomassaria Peddieae** n. sp.

On living bark of *Peddiea africana,* Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17741].

Perithecia scattered or more or less crowded, immersed in the outer bark with the ostiole protruding, globose or flattened, coriaceous-carbonaceous, 700–900 μ diam., black ; ostiole round, about 150–160 μ diam. Asci 4–8-spored, oblong, 180–200 μ × 17–27 μ. Paraphyses long, filiform, and extremely numerous, not more than 1 μ thick. Spores obliquely monostichous, later subdistichous, oblong-ellipsoid, muriform, transversely 8–10-septate, not constricted or very slightly constricted at all the septa, sometimes with a more decided constriction at the medial septum ; longitudinally 1-septate ; at first hyaline, then fuscous, later becoming olivaceous-brown, with a delicate mucilaginous envelope, 45–70 μ × 17–19 μ, often slightly curved or asymmetrical.

Pleomassaria Peddieae, Doidge, n. sp.

Perithecia sparsa, depresso-globosa, coriaceo-carbonacea, 700–900 μ diam., atra, in cortice exteriore immersa, vertice tantum prominula, ostiolo rotundo donata ; asci oblongi, 4–8-spori, 180–200 μ × 17–27 μ ; paraphysibus longis, filiformis copiosissimis ; sporae ellipsoideo-oblongae, utrinque obtusis, transverse 8–10-septatae, ad omnia septa non vel leniter constrictae, longitudinaliter 1-septatae, hinc muriformae, ex hyalino olivaceo-fuscae, 45–70 μ × 17–19 μ.

Hab. in cortice *Peddieae africanae,* Woodbush, Zoutpansberg Dist., 16.9.23, leg. Doidge [17741].

140. **Nematostigma obducens,** Syd.

Ann. Myc. XI (1913), pp. 262–263.

On leaves of *Scutia indica,* Port Elizabeth, C.P., 23.3.11, Doidge [1242].

Hypophyllous, parasitic on the mycelium of an undetermined ascomycete with thick ahyphopodiate hyphae, forming round, raised spots which are radiating, olivaceous, and 1–3 mm. in diameter. Hyphae subhyaline to pallid olivaceous-violaceous, septate, branched, 1½–2½ μ thick. Perithecia numerous, globose, 140–200 μ diam., violet-black or brown-black, with a minute, not very prominent ostiole, and set about with a few or rather numerous hyphae which are straight or slightly flexuous, obtuse at the apex, up to 110 μ long, 5–9 μ thick, frequently septate. Perithecial wall rather thin, olivaceous-brown, parenchymatous, composed of cells about 10–16 μ long. Asci mostly saccate, subsessile, 70–90 μ × 24–30 μ, eight-spored, with filiform paraphyses. Spores parallel, long fusiform, straight or slightly asymmetrical, tapering slightly towards each end, but obtuse, 6–9-septate, not or scarcely constricted, at first hyaline, pale yellow-brown or olivaceous, brown when mature, 42–55 μ × 7½–9 μ.

141. **Leptosphaeria Protearum,** Syd.

Ann. Myc. X (1912), pp. 441–442.

On leaves of *Protea melaleuca*, Wellington, C.P., 22.2.12, Doidge [2061].

On leaves of *Protea cynaroides*, mountain behind St. James, C.P., 22.12.12, Pole Evans [5573].

Produces round-irregular whitish-brown spots with a raised margin, which vary in size on different hosts—on *Protea melaleuca* they are 4–10 mm. long, on *P. cynaroides* they attain a diameter of 15–25 mm.; these are frequently confluent and so form irregular blotches of larger dimensions. Perithecia amphigenous, scattered, covered by the epidermis, later slightly protruding at the apex, lenticular, 175–275 μ diam., black, with a minute, inconspicuous papilla, parenchymatous in structure, opaque, formed of cells 7–10 μ diam., asci fasciculate, aparaphysate, eight-spored, often curved, rounded at the apex, mostly clavate, 80–100 μ × 13–17 μ, with distichous spores, rarely long cylindrical, up to 200 μ long, 10–12 μ wide, with monostichous spores. Spores oblong, obtuse, at first 1-septate and hyaline, later 3-septate and pale brown, slightly constricted at the medial septum, 18–26 μ × 5–9 μ.

142. **Phyllachora minuta,** P. Henn.

Hedwigia XLI, 1902, p. 143; Syll. Fung. XVII, p. 832.

Ann. Myc. XIII (1915), p. 531.

On leaves of *Hibiscus tiliaceus*, Port Shepstone, Natal, 15.10.12, Pole Evans [5604].

Stromata hypophyllous, sometimes also epiphyllous in groups of 4–12 on reddish-yellow leaf spots 1–1½ mm. diam.; single stromata about 300 μ diam., sometimes confluent; the leaf, which is normally 140 μ thick, is at these spots hypertrophied, becoming over 400 μ thick, and the leaf tissue is reddish in colour. The loculi are embedded in the mesophyll, 250 μ broad and high, or somewhat higher than broad, hyaline, with a very delicate wall; only at the apex there is a very short black clypeus developed by which the apex of the loculus is fused with the epidermis; there is sometimes also a dark group of hyphae at the base of the loculus. Often the short epidermal clypeus extends and fuses with that of neighbouring loculi; so also sometimes two adjacent delicate loculi also become fused into a single colourless cavity. Asci cylindrical, paraphysate, tapering to the base, 120–140 μ × 10–12 μ. Spores monostichous, elliptic, colourless, one-celled 14 μ × 9 μ.

Previously recorded from Java, the Philippines, and Australia.

143. **Catacauma goyazense** (P. Henn.), Th. et Syd.

Ann. Myc. XIII, pp. 96–397 (1915).

Syn. *Phyllachora goyazensis*, P. Henn., Hedwigia XXIV, 1895, p. 110; Syll. Fung. XI, p. 369.

On leaves of *Eugenia* sp., Kentani, C.P., 17.9.15, A. Pegler (Pegler No. 2110) [9113].

Stromata epiphyllous, scattered in irregular groups up to 5 mm. diam., black, shining, convex, single stromata up to 1 mm. diam., unilocular or with a small number of loculi; epidermal clypeus black, opaque, 60–70 μ thick; inner part of stroma lilac-brown, indistinctly prosenchymatous in structure. Loculi spherical or somewhat flattened, with their bases closely appressed to the palisade cells, 400–500 μ × 300–350 μ. Asci paraphysate, cylindrical, eight-spored, 75–85 μ × 12–15 μ. Spores monostichous, colourless, one-celled, elliptic, rounded at both ends, 13–16 μ × 6–8 μ.

I have not seen the type specimen which was collected in Brazil, but the South African specimen agrees very closely with the description in the "Annales Mycologici."

144. **Hysterostoma microspora** n. sp.

On leaves of *Weihea africana*, West Wood, Haenertsburg, 14.9.23, Doidge [17726].

Stromata hypophyllous, scattered, circular in outline, dull black, up to 5 mm. diam., carbonaceous with a rough surface, each stroma surrounded by a sparse radiating fringe

of undulating hyphae, which tend to run in strands, are pale fuscous and 2–2·5 μ thick. Loculi numerous, round to irregular closely crowded, up to 240 μ diam., 60–80 μ high, each with a central pore; outer wall radiating in structure. Hypothecium thin, colourless, attached at many points to the hypostroma, which is dark coloured, subcuticular or subepidermal, but always intercellular. Asci paraphysate, clavate, eight-spored, rounded at the apex, apedicellate, 30–37 μ × 10–11·5 μ, paraphyses numerous, filiform. Spores distichous, fuscous-olivaceous, two-celled, not constricted, kite-shaped, upper cell shorter and broader, both ends acutely rounded, 13–15 μ × 5–6 μ. The asci do not stain blue with iodine.

Hysterostoma microspora, Doidge, n. sp.

Stromata hypophylla, sparsa, atra, usque 5 mm. diam., radiato contexta, periphice in hyphas radiantes 2 μ crasses dissoluta hypostromate subcuticulari et subepidermali; loculi numerosi rotundati v. irregulares, conferti, usque 240 μ diam., 60–80 μ alti; hypothecio tenue; asci paraphysati clavati octospori, apice rotundati 30–37 μ × 10–11·5μ, paraphysibus numerosis filiformis; sporae distichae 1-septatae haud constrictae, rhomboideae, 13–15 μ × 5–6 μ, cellula superiore latiore at breviore.

Hab. in foliis *Weiheae africanae*, West Wood, Haenertsburg, 14.9.23, leg. Doidge [17726].

145. **Hysterostomina Oxyanthae**, Doidge.

Syn. *Morenoella Oxyanthae*, Doidge, Trans. Roy. Soc. S. Africa, VIII, pp. 270, 281, 1920.

On leaves of *Oxyanthus Gerrardi*, Woodbush, Zoutpansberg Dist., 7.8.11, Doidge [1758]; Kentani, C.P., 10.5.15, Pegler (Pegler No. 2321) [9073]; Town Bush Valley, Maritzburg, Natal, 21.3.16, Doidge [9719]; Louis Trichardt, 8.4.19, Putterill [11850]; Woodbush, Zoutpansberg Dist., 18.9.23, Doidge [17725]; Table Mountain, near Maritzburg, 12.7.21, Doidge [14970].

This fungus forms thin black pellicles which very readily become detached from the leaf surface, and was therefore regarded as superficial, but on examination of the leaf tissue it appears that it has a well-developed hypostroma, and must therefore be placed in the Polystomellaceae. The mycelium, which is often closely associated with the stromata, does not appear to belong to this fungus.

Amphigenous, sometimes on yellowish leaf spots, stromata flat, membranous, dull black, round, up to 5 mm. diameter, about 50 μ high. Loculi 400–600 μ × 250–300 μ closely crowded, irregularly arranged, dehiscing by longitudinal suits; covering membrane radial, dark brown to black, opaque except at the margins, composed of hyphae 3–3·5 μ thick. Hypothecium dark brown, opaque, connected at many points with the epidermal hypostroma. Asci aparaphysate, eight-spored, elliptic-ovate, sessile or very briefly pedicellate, very much thickened round the apex, 23–30 μ × 13–16 μ. Spores distichous or conglobate, ellipsoid or subclavate, unequally 1-septate, the upper cell being shorter and broader, slightly constricted, fuscous when mature, 12–16 μ × 3·5–5 μ. Hypostroma well developed in the epidermal cells, consisting of a tangled mass of hyaline hyphae which also penetrate to some extent between the cells of the mesophyll.

146. **Stigmatopeltis**, nov. gen.

Omnia ut in *Stigmatea*, sed sporis continuis, fuscis.

Stigmatopeltis Royenae, Doidge, n. sp.

On leaves of *Royena lucida*, West Wood, Haenertsburg, 14.9.23, Doidge [17727].

Ascomata epiphyllous, in small groups up to 5 mm. diam., subcuticular, remaining covered by the cuticle, smooth, lenticular, 190–240 μ diam., 60–70 μ high; covering membrane dark brown, opaque, radial in structure as seen at margin, with a round ostiole 14–17 μ in diameter. Hypothecium thin, hyaline. Asci eight-spored, oblong or clavate, sessile, 60–70 μ × 16·5–20 μ, paraphyses not seen. Spores distichous, brown, continuous,

elliptic, subclavate or rarely subpyriform, 15–16·5 μ × 5–6·5 μ, sometimes with a narrow hyaline band.

This fungus differs from the typical *Stigmatea* in having non-septate spores; in this respect it resembles *Entopeltis*, from which it differs considerably in the absence of mycelium and the structure of the ascomata. The material is rather old, and it is possible that paraphyses may be present in younger ascomata.

Stigmatopeltis Royenae, Doidge, n. sp.

Ascomata epiphylla, gregaria, 190–240 μ diam., 60–70 μ alti, brunnea, obscure radiatim contexta, hypothecio tenue hyalino; asci octospori, oblongi v. clavati, sessiles, 60–70 μ × 16·5–20 μ; sporae distichae, brunneae continuae, ellipticae, subclavatae v. rarius subpyriformae, 15–16·5 μ × 5–6·5 μ.

Hab. in foliis *Royenae lucidae*, West Wood, Haenertsburg, 14.9.23, leg. Doidge [17727].

147. **Entopeltis interrupta** (Wint.), V. Hohn.

Fragm. 3, Myk. X, No. 489, 1910.

Syn. *Asterina interrupta*, Wint., Flora, 1884, Bd. 64, p. 264, Taf. V, fig. 6.

On leaves of *Leucadendron* sp., Muizenberg, C.P., May, 1883, MacOwan (Rabh. Fung. Eur. 3952) [4292].

On leaves of *Leucospermum conocarpum*, Hottentots Holland, C.P., May, 1883, MacOwan (Rabh. Fung. Eur. 3951) [4291]; Hout Bay, 21.1.15, Bottomley [8918].

On leaves of *Protea lepidocarpon*, Lions Head, Capetown, 16.11.10 [1028].

On *Protea cynaroides*, Bainskloof, Wellington, 16.9.16, Doidge [9782].

A very exact and detailed description is given by V. Höhnel, with which I am entirely in agreement, except that the fungus appears to me to be embedded in the surface of the thick cuticle rather than under the cuticle. The brown mycelium consists of flat ribbon-like hyphae, 4–8 μ thick, with quite homogeneous contents. The single hyphae usually follow the outlines of the epidermal cells, they often are more or less zigzag or undulating, and form a network with meshes 40–200 μ wide. While the longitudinal walls of these hyphae are extremely delicate, the cross walls are thick, dark-coloured, and usually in pairs, so that the hyphae often consist of regularly alternating cells, 4–6 μ × 10–20 μ long. A few of these typical hyphae go out from each fruiting body and also invade the stomata, filling the substomatal cavity with brown hyphae and invading the neighbouring palisade cells. The infected parts of the leaf show as brownish spots, 1–6 mm. in diameter which are often confluent, and on which the black fruiting bodies appear in groups. These are also grown into the cuticle and the upper wall only is developed; they are therefore dimidiate, round, irregular, very flat-conical with a flat base, 160–225 μ diam. and about 35 μ high, unilocular. The hyaline base gives rise to a few asci, of which the outer are slanting or almost horizontal and the inner more upright. The outer wall of the fruiting body is only a single layer of cells and has in the centre a flat, round, somewhat ragged false ostiole 16–22 μ in diameter, which is formed by the breaking away of the parenchyma cells which form the wall. The cells are in radiating lines, thin-walled, 4–6-angled, and 6–9 μ diam. Asci thick-walled, stipitate, clavate, eight-spored, 60–67 μ × 20–23 μ; paraphyses thread-like, indistinct, evanescent. Spores distichous, broadly elliptic, violet-brown, 16–17 μ × 9–9·5 μ, always unicellular, but having a light-coloured band, 2–3 μ broad across the middle. [Figs. 1–2.]

148. **Asterina secamonicola** n. sp.

On leaves of *Secamone alpini*, Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17716].

Epiphyllous, forming irregular sooty blotches and often by confluence covering the greater part of the leaf surface. Mycelium fuscous, reticulate, forming a dense network similar in character to that of *Parasterina reticulata*. Hyphae 3·5–4 μ thick, branching irregularly and anastomosing; hyphopodia not numerous and only readily distinguishable on the younger parts of the mycelium, alternate, continuous, oval, hemispherical or flattened, 6·5–10 μ high, 6·5–10 μ broad. Thyriothecia numerous, dark brown, scattered, flattened-

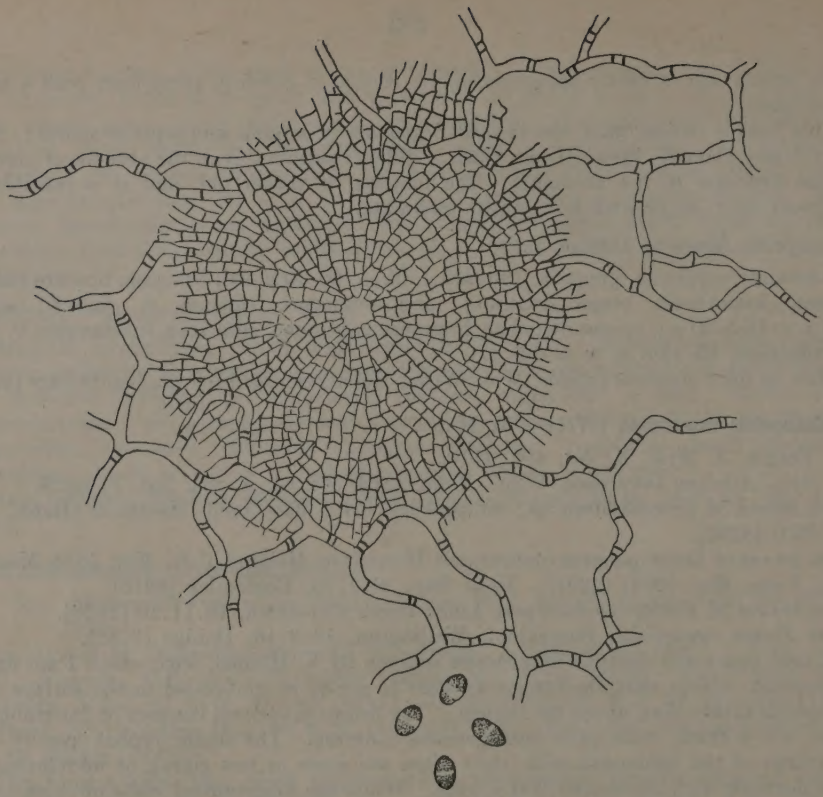

Fig. 1.

Entopeltis interrupta. Thriothecium, mycelium, and spores; surface view.

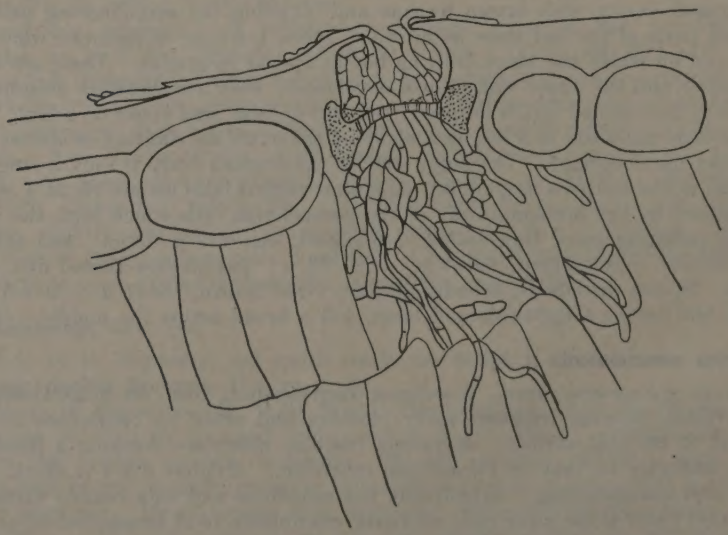

Fig. 2.

Entopeltis interrupta. Mycelium growing through stoma.

hemispherical, 200–240 μ diam., covering membrane formed of radiating hyphae 3 3·5 μ thick, margin at first crenate, more or less fimbriate at maturity. Asci aparaphysate, ovate or subspherical, eight-spored, sessile, thickened round apex, 40–50 μ × 24·27 μ or 30 μ × 27–30 μ. Spores conglobate, two-celled, brown, slightly constricted, upper cell broader and more broadly rounded than lower, 20 23·5 μ × 9 10 μ; lower cell, 6·5–7 μ.

Asterina secamonicola, Doidge, n. sp.

Epiphylla, plagulas irregulares, atras confluentes formans; mycelium fuscum, reticulatum ex hyphis brunneis ramosis 3·5 4 μ crassis compositum. Hyphopodia haud numerosa, alterna, ovata, hemisphaerica v. depressa, continua, 6·5–10 μ longa, 6·5–10 μ lata. Thyriothecia numerosa, atro-brunnea, sparsa dimidiata, orbicularia 200–240 μ diam. ex hyphis radiatis 3 3·5 μ crassis contexta: asci aparaphysati, ovati v. subglobosi octospori apice incrassati, 40 50 μ × 24 27 μ or 30 μ × 27 30 μ; sporae conglobatae, 1-septatae, brunneae, leniter constrictae, 20–23·5 μ × 9–10 μ, cellula superiore latiore.

Hab. in foliis *Secamones alpini*, Woodbush, Zoutpansberg Dist., 16.9.23, leg. Doidge [17716].

149. **Microthyrium ranulisporum** n. sp.

On *Scolopia Mundtii*, Komgha, C.P., July, 1919, E. P. Phillips [14152].

Thyriothecia hypophyllous, scattered or in small groups, minute, black, superficial dimidiate, round, 240–360 μ diam., about 30 μ high in the centre and with a round ostiole about 20–30 μ diam., covering membrane radiating in structure, composed of undulating hyphae about 2 μ thick in the centre and 3–3·5 μ thick near the margin. Margin irregular, but not fimbriate. Asci numerous, paraphysate, eight-spored, sessile, oblong, thickened round the apex, 90–100 μ × 10–14 μ, not staining blue with iodine. Spores distichous, hyaline or flavescent, two-celled like tadpoles in shape, 25–30 μ × 3·5–5 μ, upper cell oval, 6·5 8·5 μ × 3·5 5 μ, lower cell narrow, cuneate, tapering, 16·5 23·5 μ × 3 μ.

Microthyrium ranulisporum, Doidge, n. sp.

Thyriothecia hypophylla sparsa v. laxe gregaria minuta, atra, superficialia, dimidiata, orbicularia 240 360 μ diam. ex hyphis undulatis, brunneis 2 3·5 μ contexta, ostiole rotundo 20–30 μ diam.: asci numerosi, paraphysati, octospori, sessiles, oblongi, apice incrassati, 90 100 μ × 10 14 μ: sporae distichae, hyalinae v. flavescentes, 1-septatae ranuliformae, 25–30 μ × 3·5 5 μ, cellula superiore elliptica, 6·5 8·5 μ × 3·5 5 μ, cellula inferiore anguste cuneata, attenuata, 16·5–23·5 μ × 3 μ.

Hab. in foliis *Scolopiae Mundtii*, Komgha, C.P., 1919, leg. E. P. Phillips [14152].

150. **Irene Peddieae** n. sp.

On leaves of *Peddiea africana*, Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17777].

Hypophyllous, forming dark irregular blotches up to 10 mm. diam. Mycelium brown, forming rather a dense network: hyphae 6 7 μ thick, sinuous, with opposite branches: cells about 30–35 μ long: capitate hyphopodia alternate, not crowded, usually one to each cell, 24–30 μ high, stalk cell cylindrical or becoming slightly thicker from the base upwards, head cell irregularly 2 4-lobed, lobes rounded, flattened or bi-lobulate, 15 20 μ broad: mucronate hyphopodia not very numerous, opposite, alternate or unilateral, lageniform, straight, curved or gibbose, 17 20 μ high, 6 7 μ broad. Perithecia scattered, spherical, 200 240 μ diam., without setae or appendages, collapsing at maturity, formed of cells about 10 μ diam. Spores brown, 3-septate, straight or slightly curved, oblong, rounded at both ends, somewhat constricted at the septa, 40–44 μ × 15 16·5 μ. [Fig. 3.]

Irene Peddieae, Doidge, n. sp.

Mycelium hypophyllum, plagulas irregulares usque 10 mm. diam. efformans: hyphis sinuosis 6 7 μ crassis, ramis oppositis hyphopodiis capitatis alternis 24 30 μ altis, 15–20 μ latis; cellula superiore 2 4-lobata, lobis rotundatis, truncatis v. bilobulatis; hyphopodiis

mucronatis lageniformis, 17–20 μ × 6·7 μ. Perithecia sparsa, globosa, 200–240 μ diam. in sicco collapsa ; asci non visi. Sporae 3-septatae, leniter constrictae, brunneae, oblongae utrinque rotundatae, 40–44 μ × 15–16·5 μ.

Hab. in foliis *Peddieae africanae*, Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17777].

Fig. 3.

Irene Peddieae. Mycelium and spores.

151. **Meliola Choristylidis** n. sp.

On leaves of *Choristylidis rhamnoides*, Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17733].

Epiphyllous, colonies round or irregular in outline, black, 4–10 mm. in diameter. Mycelium forming an open network composed of hyphae 6·5–7·5 μ thick, with opposite branches. Capitate hyphopodia opposite or alternate, not crowded, 14–17 μ long, 8·5–10 μ broad, stalk cell short, cylindrical, head cell smooth, ovate. Mucronate hyphopodia abundant in the older parts of the colony, opposite, bottle-shaped or flask-shaped, 14–17 μ × 6·5 μ. Mycelial setae abundant around perithecia, 200–250 μ high, dark brown, and 6·5–10 μ thick at the base, tapering towards the tips and becoming lighter in colour : once to four times dichotomous, primary branches 120–150 μ from the base, at right angles

to one another or more widely divergent, secondary and tertiary branches when present usually almost at right angles; primary and secondary branches 40–50 μ long, further branches usually shorter, and ultimate branches often not more than 5–6 μ long. Perithecia scattered, black, spherical 150–175 μ diam., verrucose, wall formed of rounded, conical cells 10–14 μ diam. Asci two-spored, evanescent. Spores brown, oblong, 4-septate, broadly rounded at both ends, slightly constricted, 36–40 μ × 13–15 μ. [Fig. 4.]

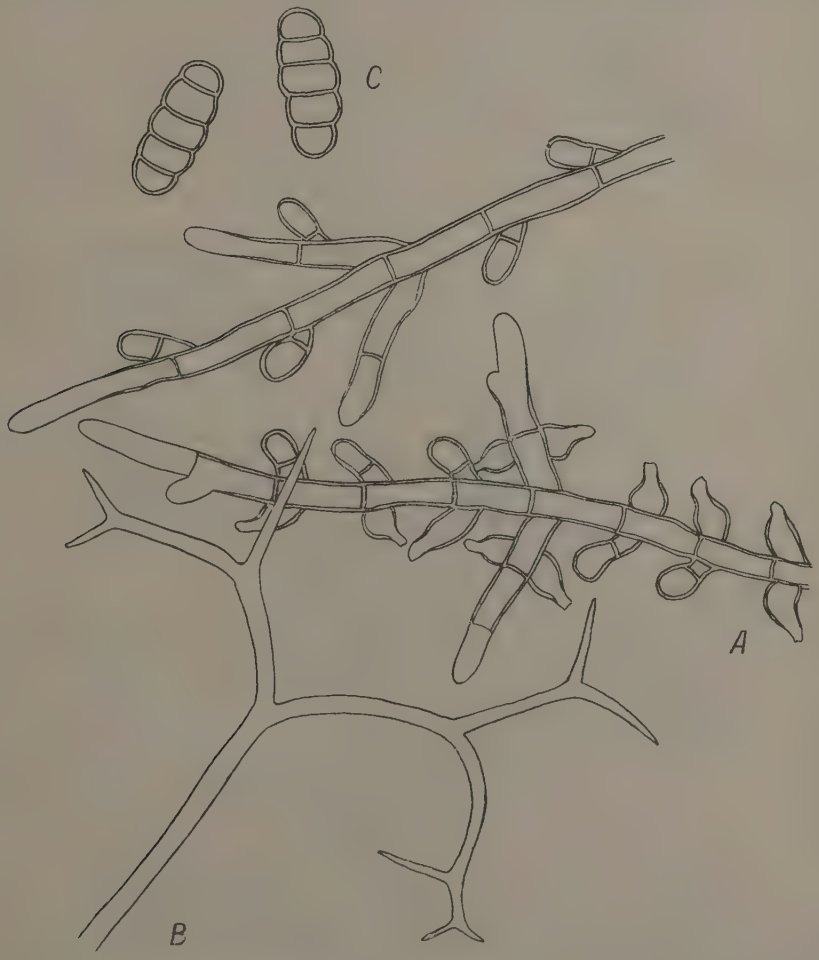

Fig. 4.

Meliola Choristylidis. A, mycelium; B, seta; C, spores.

Meliola choristylidis, Doidge, n. sp.

Plagulae epiphyllae, atrae, orbiculares v. irregulares, 4–10 μ diam.; mycelium reticulatum ex hyphis 6·5–7·5 μ crassis, opposite ramosis compositum; hyphopodia capitata opposita v. alternantia, 14–17 μ longa, cellula basali brevi, cellula superiore integra ovata, 8·5–10 μ lata; hyphopodia mucronata numerosa, opposita, ampullacea, 14–17 μ × 6·5 μ; et ae mycelicae modice copiosae, tantum ad basim peritheciorum evolutae, 200–250 μ longae.

ad basim opacae 6·5–10 μ crassae superne in ramos duos, 40–50 μ longos patentes divisae, ramis iterum in ramulos duos variae longitudinis ad apicem bifurcatos divisis; perithecia sparsa atra, globosa, 150–170 μ diam., verrucosa; asci bi-spori mox diffluentes; sporae brunneae, oblongae, 4-septatae, utrinque rotundatae, leniter constrictae, 36–40 μ × 13–15 μ.

Hab. in foliis *Choristylidis rhamnoidis*, Woodbush, Zoutpansberg Dist., 16.9.23, leg. Doidge [17733].

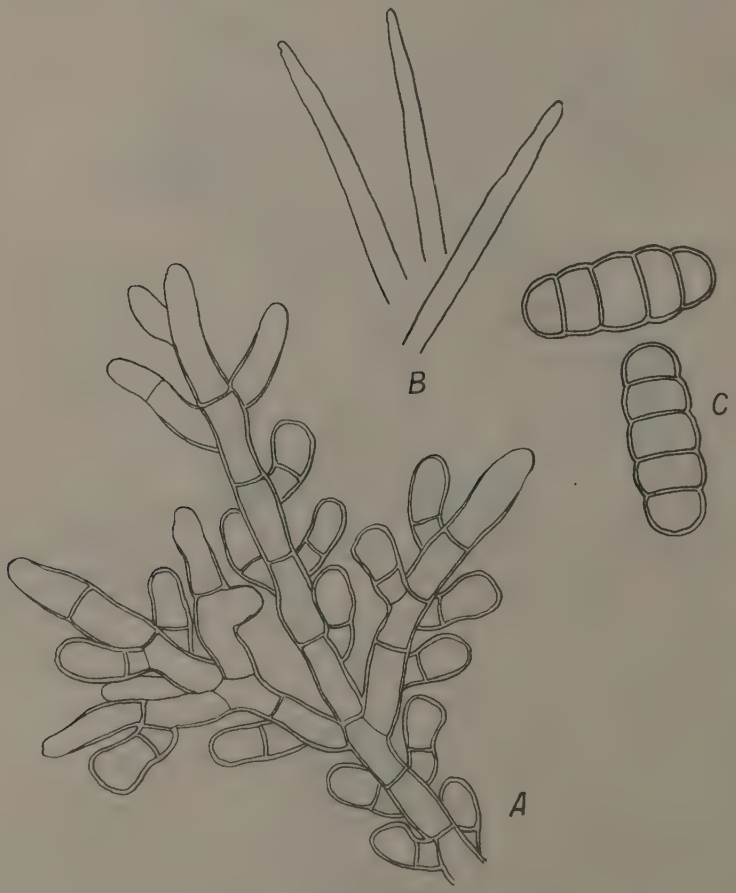

Fig. 5.

Meliola transvaalensis. A, mycelium; B, tips of setae; C, spores.

152. **Meliola transvaalensis** n. sp.

On leaves of *Myrsine africana*, Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17746].

Amphigenous, forming black spots 2–5 mm. in diameter. Mycelium dark brown, dense, hyphae 7–10 μ thick, branches usually opposite. Capitate hyphopodia crowded, opposite, at right angles to or appressed towards the hyphae, 15–20 μ high, stalk cell cylindrical, head cell ovate or flattened by compression, about 10 μ broad. Mucronate hyphopodia rare, ampulliform with a curved neck, 16–23 μ × 6–7 μ. Mycelial setae black, opaque, simple, most numerous in the neighbourhood of the perithecia 450–650 μ long,

10 μ thick at the base, not tapering, or tapering very gradually to the blunt apex. Perithecia crowded in the centre of the colony, black, carbonaceous, spherical, 250-290 μ diam., wall formed of rounded, conical cells. Spores oblong, 4-septate, broadly rounded at both ends, very slightly constricted, 44–50 μ × 16–18·5 μ. [Fig. 4.]

Meliola transvaalensis, Doidge, n. sp.

Amphigena, plagulas atras 2–5 mm. latas formans; mycelium ex hyphis 7–10 μ crassis septatis, ramosis compositum; hyphopodia capitata numerosa, opposita, 15-20 μ longa, cellula superiore ovata, circ. 10 μ lata; hyphopodia mucronata rara lageniformia, 16–23 μ × 6–7 μ; setae mycelicae tantum ad basim peritheciorum evolutae, rectae vel sub-rectae simplices 450-600 μ longae, ad basim 10 μ crassae, haud attenuatae, vel apicem obtusum sensim attenuatae: perithecia gregaria, globosa, atra, 250 290 μ diam.; asci mox diffluentes: sporae oblongae, 4-septatae, leniter constrictae, brunneae, utrinque late rotundatae, 44–50 μ × 16–18·5 μ.

Hab. in foliis *Myrsines africanae*, Woodbush, Zoutpansberg Dist., 16.9.23, leg. Doidge [17746].

153. **Treubiomyces Celastri** n. sp.

On leaves of *Celastrus* sp., Woodbush, Zoutpansberg Dist., 18.9.23, Doidge [17769].

Epiphyllous, forming round to irregular fuscous spots 3–5 mm. diam., mycelium superficial, composed of a network of pale greyish, torulose hyphae 3–5 μ thick; setae scattered, arising from a small group of pseudoparenchyma, black, erect, straight or somewhat curved, 170 240 μ long, 5–8 μ thick at the base, tapering gradually to the apex. Perithecia smooth, without setae, scattered, flattened-spherical, 160 240 μ diam., wall composed of several layers of cells 8–10 μ diam., some of these having a tendency to separate into hyphae when crushed; ostiole indistinct, not typical, about 18 μ diam. Asci fasciculate, aparaphysate, eight-spored, broadly clavate, rounded and thickened at the apex, obtusely cuneate at the base, 50 70 μ × 20 27 μ. Spores pluriseriate, hyaline, muriform, oblong or subclavate, with 5-7 transverse septa, some of the cells with one longitudinal septum, slightly constricted at some of the septa, 27–30 μ × 7–8·5 μ.

Treubiomyces Celastri, Doidge, n. sp.

Epiphylla, plagulas orbiculares v. irregulares fuscas, 3–5 mm. diam. formans; mycelium ex hyphis torulosis griseis, 3–5 μ crassis compositum, setae mycelicae sparsae atrae rectae v. subcurvatae, 170 240 μ longae, ad basim 5–8 μ crassae apicem versus paullatim attenuatae; perithecia sparsa, leves, setis nullis, globoso-depressa, 160 240 μ diam., e cellulis 8–10 μ diam. obscure olivaceis contextis; asci fasciculati, aparaphysati, octospori, late clavati, apice incrassati, 50 70 μ × 20 27 μ: sporae hyalinae, muriformes, oblongae v. subclavatae, transverse 5 7-septatae, longitudinaliter 1-septatae, ad septa leniter constrictae, 27–30 μ × 7–8·5 μ.

Hab. in foliis *Celastri* sp., Woodbush, Zoutpansberg Dist., 18.9.23, leg. Doidge [17769].

154. **Aithaloderma capense** n. sp.

On leaves of *Schotia latifolia*, East London, C.P., 19.7.19, Doidge [12422].

Epiphyllous, diffuse, superficial, forming a very thin pellicle, easily detached from the leaf, black or olivaceous, opaque; mycelium fuscous-olivaceous, reticulate, formed of a few thicker hyphae 6·5–12 μ thick, with cells about 30 μ long and not longitudinally connate as in *A. clavatisporum*, and a closer network of fine hyphae not paler than the thicker ones and 3 3·5 μ thick; hyphae of both kinds occasionally becoming subtorulose. Conidia and pycnidia not seen. Perithecia fairly evenly scattered, 100 120 μ diam., black, coriaceous, briefly conoid, distinctly ostiolate, the ostiole being set about with a varying number of black, opaque setae. Setae 24 30 μ long, 6 6·5 μ thick at the base, and tapering to the blunt apex, slightly curved, continuous. Perithecia parenchymatous in structure, composed of cells 4–5 μ diam. Asci sub-clavate or ovate, eight-spored, aparaphysate, thin-walled, and disappearing rather early, 30 37 μ × 10 12 μ. Spores 3–4-stichous or parallel, hyaline, subclavate, 3-septate, often slightly constricted at the septa, 20–24 μ × 3·5–5 μ.

Aithaloderma capense is closely related to *A. clavatisporum*, Syd. (Ann. Myc. XI. p. 257, 1913), but differs in the character of the mycelium and in the size of the spores and perithecia.

Aithaloderma capense, Doidge, n. sp.

Epiphyllum, effusum, superficiale, tenue, pelliculosum facile decedens, atrum vel atro-olivaceum, opacum; mycelium rete dense efformans ex hyphis crassioribus 6·5–12 μ crassis (articulis circ. 30 μ longis) et tenuioribus 3–3·5 μ crassis compositum; perithecia aequaliter sparsa breviter conoidea, 100–120 μ diam., atra, coriacea, distincte ostiolata, circa ostiolum setis paucis vel pluribus atris opacis 24–30 μ longis, 6–6·5 μ latis continuis obsita, parenchymatice ex cellulis 6–8 μ diam. contexta; asci subclavati v. ovati, octospori, aparaphysati, 30–37 μ × 10–12 μ; sporae 3–4 stichae vel parallelae, hyalinae, subclavatae, 3-septatae, plerumque ad septa leniter constrictae, 20–24 μ × 3·5–5 μ.

Hab. in foliis *Schotiae latifoliae*, East London, 19.7.19, leg. Doidge [12422].

155. **Limacinia transvaalensis,** Doidge.

Syn. *Zukalia transvaalensis*, Doidge, Trans. Roy. Soc. S. Africa, 5, p. 721, Pl. 58, Fig. 9, 1916.

Parasitic on the mycelium of *Parasterina brachystoma*.

On leaves of *Eugenia Gerrardi*, Woodbush, Zoutpansberg Dist., 3.8.11, Doidge [1759]; 16.9.23 [17757].

Mycelium pale fuscous, reticulate, septate, hyphae 3–3·5 μ thick, closely investing the hyphopodiate mycelium of *Parasterina brachystoma*. In the original description the hyphopodiate mycelium of the host was erroneously described as belonging to *Zukalia transvaalensis*. Perithecia black, globose, scattered, sub-pellucid, brown, smooth, with a false ostiole, 130–170 μ diam. Asci numerous, fasciculate, eight-spored, thin-walled, elliptic or narrow-ovate, frequently slightly curved. Paraphyses none. Spores distichous or tristichous, clavate, hyaline, 5-septatae, 45–55 μ × 5–7 μ, obtuse at both ends.

156. **Limacinia Nuxiae** n. sp.

On leaves of *Nuxia tomentosa*, Woodbush, Zoutpansberg Dist., 18.9.23, Doidge [17744].

Mycelium hypophyllous, diffuse; hyphae fuscous-olivaceous, branched, septate, 3–3·5 μ thick, forming a tangled network, which is densest in the neighbourhood of the perithecia. Perithecia in small groups, spherical, minute, fuscous-olivaceous, astomous, 50–60 μ diam. Asci few in each perithecium, eight-spored, aparaphysate, ovate, briefly pedicellate, thickened round the apex, 30–37 μ × 16–17 μ. Spores oblong or subclavate, hyaline, transversely 3-septate, sometimes constricted at the medial septum, rounded at both ends, 17–20 μ × 3·5–5 μ.

Limacinia Nuxiae, Doidge, n. sp.

Hypophylla, mycelium ex hyphis fuscis-olivaceis, ramosis, septatis, 3–3·5 μ crassis compositum; perithecia sparsa v. gregaria, globulosa, astoma, 50–60 μ diam.; asci pauci in quoque perithecio, octospori, aparaphysati, ovati, breviter pedicellati, apice incrassati, 30–37 μ × 16–17 μ; sporae oblongae v. subclavatae, hyalinae, transverse 3-septatae, haud constrictae vel septo medio leniter constrictae utrinque rotundatae, 17–20 μ × 3·5–5 μ.

Hab. in foliis *Nuxiae tomentosae*, Woodbush, Zoutpansberg Dist., 18.9.23, leg. Doidge [17744].

157. **Microthyriella transvaalensis** n. sp.

On *Celastrus* sp., Woodbush, Zoutpansberg District, 18.9.23, Doidge [17770].

Thyriothecia epiphyllous, minute, punctiform, dimidiate, orbicular, dark brown, 240–270 μ diam., pseudo-parenchymatous in structure, composed of irregular, angular cells 5–6 μ diam., without a definite ostiole: the central part of the thyriothecial wall appears to break away at maturity. Asci aparaphysate, ovate or elliptic, eight-spored,

27–33 μ × 16–17 μ. Spores distichous, oblong or subclavate, hyaline, 1-septate, not or barely constricted at the septum, broadly rounded at both ends, 12–16 μ × 4·5–5 μ.

Microthyriella transvaalensis Doidge, n. sp.

Thyriothecia epiphylla, minuta, dimidiata, orbicularia, brunnea, 240–270 μ diam., pseudoparenchymatice ex cellulis irregularibus 5–6 μ diam. contexta, ostiolo nullo; asci aparaphysati, ovati v. elliptici, octospori, 27–33 μ × 16–17 μ; sporae distichae, oblongae v. subclavatae, hyalinae, 1-septatae, haud v. vix constrictae, utrinque late rotundatae, 12–16 μ × 4·5–5 μ.

Hab. in foliis *Celastri* sp., Woodbush, Zoutpansberg Dist., 18.9.23, leg. Doidge [17770].

158. **Stomiopeltella africana** n. sp

On leaves of *Peddiea africana*, Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17778].

Epiphyllous, diffuse; mycelium reticulate, without hyphopodia, primary hyphae straight, radiating, pale fuscous, about 2·5 μ thick, branching irregularly and anastomosing to form an open network; branches paler and slightly thinner than the primary hyphae, often sinuous. Thyriothecia scattered, olivaceous-fuscous, dimidiate, round, 90–120 μ diam., pseudo-parenchymatous in structure, at the margin composed of a dense network of hyphae, which are in intimate connexion with the mycelial network; at maturity there is a central pore. Asci aparaphysate, sessile, oblong, eight-spored, 20–24 μ × 6·5–10 μ. Spores hyaline, two-celled, subclavate, upper cell somewhat shorter and broader, rounded at both ends, 13–14 μ × 3·5–4 μ.

Stomiopeltella africana, Doidge, n. sp.

Epiphylla, mycelium pallide fuscum, reticulatum, ex hyphis 2–2·5 μ crassis, ramosis compositum; thyriothecia sparsa, fusca, dimidiata orbicularia, 90–120 μ diam., pseudo-parenchymatice contexta, poro rotundo pertusa; asci aparaphysate, sessiles, octospori oblongi, 20–24 μ × 6·5–10 μ; sporae hyalinae, 1-septatae, subclavatae, leniter constrictae, 13–14 μ × 3·5–4 μ, cellula superiore paullo latiore et breviore.

Hab. in foliis *Peddiae africanae*, Woodbush, Zoutpansberg Dist., 16.9.23, leg. Doidge [17778].

159. **Stomiopeltella petiolaris** n. sp.

On petioles of *Cussonia spicata*, Woodbush, Zoutpansberg Dist, 16.9.23, Doidge [17718].

Forming thin, effuse, black pellicles on the petioles, which are sometimes almost entirely covered with the spreading film of the fungus. Hyphae pale fuscous, 3–3·5 μ thick, frequently septate and often constricted at the septa, branching repeatedly and anastomosing freely, and finally forming a pseudo-parenchymatous pellicle in which the network of more robust, darker, primary hyphae is still plainly discernible. Thyriothecia scattered, flattened-hemispherical, 150–170 μ diam., darker than the mycelium, irregularly pseudo-parenchymatous in structure and with a small central ostiole. Asci aparaphysate, eight-spored, elliptic, sessile not thickened round apex, 27–36 μ × 10–12 μ. Spores distichous, hyaline, oblong to subclavate, two-celled, very slightly constricted, rounded at both ends, 13·3–15 μ × 3·5–5 μ.

Stomiopeltella petiolaris, Doidge, n. sp.

Thyriothecia petiolicola, sparsa, 150–170 μ diam., dimidiata, orbicularia pseudo-parenchymatice contexta, fuscidula poro rotundo aperta; asci aparaphysati, octospori, elliptici, sessiles, 27–36 μ × 10–12 μ; sporae distichae, hyalinae, oblongae v. subclavatae, 1-septatae, vix constrictae, utrinque rotundatae, 13·3–15 μ × 3·5–5 μ; mycelium dilute fuscum, primitus reticulatum deinde fere pseudoparenchymaticum, ex hyphis 3–3·5 μ crassis, septatis, ramosis ad septa constrictus compositum.

Hab. in petiolis *Cussoniae spicatae*, Woodbush, Zoutpansberg Dist., 16.9.23, leg. Doidge [17718].

THE GENUS CYSTOPUS IN SOUTH AFRICA.

E. M. WAKEFIELD.

A CLEAR account of the history of this genus, and the reasons for adopting the name *Cystopus* rather than *Albugo*, was given by Ramsbottom in the *Journal of Botany*, No. 54, 1916, p. 77. The chief points may be briefly recapitulated here.

The first species of the genus to be described was the so-called "white rust" of cruciferous plants, which was named *Aecidium candidum* by Persoon (1791). Later (1795), Persoon proposed the genus *Uredo* to include this species and two others. In his "Synopsis Methodica Fungorum" (1801) the genus *Uredo* is divided into four sections, the third of which is *Albugo*, characterized by having white spores, and including *Uredo candida* (with forms *α U. Thlaspeos*, *β U. Tragopogi*, *γ U. Alyssi*) and *U. Cheiranthi*.

In "Fries Systema Mycologicum," from which, according to the International Rules of Nomenclature, the nomenclature of the Phycomycetes starts, none of the species included in Persoon's section *Albugo* is mentioned. The next important date is 1847, when Léveillé founded the genus *Cystopus*, to include *Uredo candida* Pers., *U. cubica* Mart., *U. Portulacae* DC., *U. Bliti* Bivon, *U. floriformis* Mérat, etc., though no combinations were made. De Bary in 1860 confirmed the statement made earlier by Prévost that the spores on germination in water give rise to zoospores, and pointed out the true affinities of the genus. Three years later he discovered the sexual organs, and gave a full account of the life-history. Specimens showing oospores, accompanied by a descriptive label, were distributed by De Bary in Rabenhorst's "Fungi Europaei Exsiccata, ed. ii, ser. ii, Cent. 5, 1862.

From this it is clear that the generic name *Cystopus* is the correct one to use, according to the International Rules, and Kuntze's revival of Persoon's sectional name *Albugo* in 1891 was contrary to those rules.

The greater difficulty, as Ramsbottom pointed out, occurs in the nomenclature of the species: for if *Cystopus* Lév., 1847, is taken as the starting point, it would necessitate the changing of several well-known and universally used names. On the other hand, this difficulty is obviated by agreeing to start from De Bary, and in accordance with the ruling that the first name given to the "perfect" stage (the sexual organs being regarded as the perfect stage in the *Phycomycetes*) is valid, it is in fact correct to do so. *Cystopus* de Bary is, therefore, the valid name for the complete fungus, including the oosporic stage, while *Cystopus* Lév. is invalid as having been applied to the conidial stage only. The nomenclature of both genus and species starts with De Bary.

The genus is represented in South Africa by eight species, of which five are practically cosmopolitan, while three are so far known only from South Africa.

The type species is *C. candidus*, the well-known "white rust" of Cruciferous plants. Morphologically no constant distinction can be found between the forms which occur on various genera of the order *Cruciferae*, but recent work has tended to show that there probably exist "biological species" or races, as in the case of the true Rusts. The form occurring on *Heliophila* in South Africa was distinguished by P. Hennings as *C. candidus* f. *Heliophilae* on the ground that its conidia were slightly larger than in the type form. Measurements taken from numerous specimens, both European and South African, have shown, however, that the distinction does not hold, the limits of variation being practically the same in all.

Nothing is known as to the existence of biological forms in the other species of *Cystopus*, but there is sometimes, as in the case of *C. cubicus*, a difference on various hosts in regard to the readiness with which oospores are formed.

Morphological distinction between the species rests mainly on the characters of the oospores, and in a lesser degree on conidial characters. Not all the South African material has yielded oospores, but where the conidia correspond to those occurring on the same host in Europe it is assumed that the oospores will also be similar.

Descriptions of the species occurring in South Africa are given below. These have been compiled actually from South African specimens, with the addition of known oospore characters when these have not been found in the South African material. In all cases the details have been taken from dried specimens, the spores being examined by mounting either in lactic acid or in water to which has been added a little dilute potassium hydrate solution. The numbers in brackets following the specimens cited are those of the Mycological Section of the National Herbarium.

CYSTOPUS de Bary, "Ann. Sci. Nat." Sér. 4, t. xx, 1863, p. 31 (and 129).

Mycelium parasitic, endophytic, branched, provided with vesicular haustoria. *Sori* sub-epidermal, at length exposed through rupture of the epidermis. *Conidiophores* simple, cylindrical or clavate, crowded. *Conidia* borne in chains, globose or somewhat rectangular, smooth, hyaline or with light yellowish contents, germinating to produce zoospores. *Sexual organs*, oogonia and antheridia, formed on mycelial branches within the host tissues. *Oospores* globose, epispore usually deeply coloured, and with tuberculate or reticulate thickening. Germination by means of zoospores.

Type species: *Cystopus candidus* de Bary.

KEY TO THE SOUTH AFRICAN SPECIES OF *CYSTOPUS*.

I. Aequales.—Conidial wall thin, equally thick throughout.

(*a*) Conidia all alike; oospore wall with thickenings in the form of flattened warts or short ridges..... *C. candidus.*

(*b*) Terminal conidia larger and thicker-walled than the others:

(*α*) Oospore wall reticulate, with warts in centre of meshes *C. Portulacae.*

(*β*) Oospore wall finely warted..... *C. austro-africanus.*

II. Annulati.—Conidial wall with a more or less distinct internal ring-like thickening at the equator; terminal conidia always distinct from the rest, and sterile:

(i) Oospores known:

(*a*) Oospore wall reticulate, the angles of the network produced into more or less distinct warts (on *Compositae*)..... *C. cubicus.*

(*b*) Oospore wall papillate or with irregular ridges (on *Convolvulaceae*)..... *C. Ipomoeae-panduranae.*

(*c*) Oospore wall coarsely reticulate..... *C. Bliti.*

(ii) Oospores not known:

(*a*) On *Hypoestes verticillata*. Conidia distinctly "cuboid" *C. quadratus.*

(*b*) On *Nemesia* sp. Conidia only slightly "cuboid".... *C. Evansii.*

Cystopus candidus de Bary in "Ann. Sci. Nat.," Sér. 4, xx, 1863, p. 31 and 130.

Syn. *Aecidium candidum* Pers. in Gmel. Syst. Nat. 2, 1791, p. 1473.
Uredo candida Pers. Syn. Fung. 1801, p. 223.
Cystopus candidus Lév., Ann. Sci. Nat. Sér. 3, viii, 1847, p. 371.
Albugo candida Kuntze, Rev. Gen. Plant. 2, 1891, p. 658.

Sori developed on all above-ground parts of the host plant, whitish, variable in size, often producing distortion or gall-like swellings. *Conidiophores* hyaline, clavate, 28–40 × 12–15 (–18) μ. *Conidia* all alike, hyaline, globose or sub-globose, with uniformly thin walls, 12–20 (–22) μ in diameter, average 15–18 μ. *Oospores* developed usually in the tissue of stems and fruits, rarely in the leaves, globose, dark brown, 40–55 μ; epispore ornamented with coarse flattened warts or low ridges, which are often irregularly branched.

The form on *Heliophila*, which was named forma *Heliophilae* by Hennings, does not differ from that on other hosts. Its sole distinction was said to be in the larger conidia, but conidia up to 20 μ occur quite frequently on all the hosts examined. Immature oospores are present in the type material of forma *Heliophilae* Henn.

On *Cruciferae* :—

Brassica napus : Brooklyn, Pretoria, A. M. Bottomley, April, 1925 (20400).
Brassica nigra Koch : Equeefa, Zululand, C. Fuller, 24.4.11 (1537).
Brassica sp. : Natal, J. Medley Wood (10453).
Brassica sp. : Port Elizabeth, E. M. Doidge, 23.3.11 (1232).
Cardamine capensis L. : Somerset East, MacOwan, (*Thuemen, Myc. Univ.* 1314, in *Herb. Kew*, and *MacOwan, Austro-africanae* 1199, *Herb. Kew*).
Cardamine africana Th. : Boschberg, 1287 *ex Herb. Kalchbrenner* (*Herb. Kew*).
Cochlearia Armoracia L. : Constantia, Cape Province, C. P. Lounsbury, 27.8.09 (718); Capetown, C. W. Mally, 20.12.18 (11822).
Heliophila sp. : Capetown, C. P. Lounsbury, 23.9.06 (192).
Heliophila Meyeri Ld. : Van Rhynsdorp, 600 ft., Schlechter, July, 1896 (*Herb. Kew*, co-type of forma *Heliophilae* Henn).
Sisymbrium gariepinum Burch. : Bloemfontein, O.F.S., Professor Potts, Dec., 1915 (9756).

Cystopus Portulacae de Bary in "Ann. Sci. Nat.," Sér. 4, xx, 1863, p. 31 and 131

Syn. *Uredo Portulacae* DC., "Fl. France," vi, 1815, p. 88.
Cystopus Portulacae Lév., "Ann. Sci. Nat.," Sér. 3, viii, 1847, p. 371.
Albugo Portulacae Kuntze, "Rev. Gen.," Pl. 2, 1891, p. 658.

Sori developed on all above ground parts of host, whitish to yellowish, rounded or irregular, up to 5 mm. in diameter. *Conidiophores* clavate, hyaline, 40–50 (–75) × 14–15 μ. *Conidia* of two kinds; terminal conidia sub-globose, yellowish, 13–15 × 15–20 μ, rather thick-walled, with a basal invagination of the wall which gives the appearance of a thick inner peg in lateral view, or a central ring when seen from above. *Oospores* occurring in stems and leaves, globose, dark brown when mature, up to 70 μ in diameter; epispore reticulate, with meshes 8–12 μ in diameter, and usually a papilla or short ridge in the centre of each mesh.

On *Portulaca oleracea* :—

Skinner's Court, Pretoria District, 22.12.05 (101).
Pretoria, J. Burtt-Davy, 8.1.04 (148); 21.1.05 (157).
Lyttelton Junction, Pretoria District, 30.4.11, Miss J. Erasmus (1515). [Shows oospores.]
Garstfontein, Pretoria District, P. J. Pienaar, 15.2.12 (2145).
Somerset East, 1877, MacOwan 1303, *ex Herb. Kalchbrenner* (*Herb. Kew*).
Somerset East, MacOwan, in Rabenhorst, Winter Fungi Europaei 3775, and in Thuemen, Myc. Univ. 252*b* (*Herb. Kew*). [Thuemen's specimen with oospores.]

Cystopus austro-africanus (*Syd.*) *Wakef.* comb. nov.

Syn. *Albugo austro-africana* Syd. in Ann. Myc. x, 1912, p. 437.

Sori amphigenous, rounded or elliptical, yellowish, ½–1 mm. in diameter. *Conidiophores* clavate, hyaline, 35–50 × 16–18 (–20) μ. *Conidia* of two kinds; terminal conidia globose

or sub-globose, thick-walled (2 μ), yellowish, 18–25 μ in diameter, probably sterile; fertile conidia hyaline, thin-walled, globose or sub-globose, 14–20 μ in diameter. *Oospores* developed in tissue of leaf, globose, chestnut-brown, about 50 μ in diameter, epispore with densely crowded minute papillae.

On leaves of *Aizoon rigidum*: Port Elizabeth, E. M. Doidge, 22.3.11 (1234). Co-type material examined.

Cystopus cubicus de Bary in "Ann. Sci. Nat.," Sér. 4, xx, 1863, p. 32 and 132.

Syn. *Uredo cubica* v. Strauss, Ann. Wetterau Ges. f. naturk. II, 1810, p. 86.
Uredo Tragopogi DC., Fl. Fr. II, 1805, p, 237.
Cystopus cubicus Lév. Ann. Sci. Nat., Sér. 3, viii, 1847, p. 371.
Cystopus Tragopogonis Schroet, Krypt. Fl. Schles III, 1, 1886, p. 234.
Albugo Tragopogonis S. F. Gray, Nat. Arr. Brit., Pl. 1, 1821, p. 540.
Cystopus spinulosus de Bary in Rabenh. Fung. Eur. No. 479, 1862.

Sori forming prominent blisters on leaves or stems, whitish or yellowish, rounded or elongate. *Conidiophores* hyaline, clavate, 50–80 × 15–20 μ. *Conidia* of two kinds; terminal conidia globose, hyaline or yellowish, evenly thick-walled, slightly larger than the others, sterile: fertile conidia shortly cylindrical, hyaline, 15–22 (–25) × 15–18 μ, membrane with a distinct internal equatorial thickening. *Oospores* occurring in stems or leaves, on some hosts freely, in others less so, dark-brown or almost black and opaque when mature, 44–75 μ in diameter, epispore finely reticulate with meshes 2–5 μ in diameter, and the network produced into more or less prominent tubercles at the angles.

On *Compositae*:—

Senecio angustifolia Willd, Pretoria, I. B. Pole Evans, Oct. 1919 (11325). Immature oospores present.

Senecio orbicularis Sond., Pretoria, Miss A. M. Bottomley, 26.5.16 (9744); Irene, Pretoria District, I. B. Pole Evans, Dec. 1924 (20365).

Scenecio inaequidens DC., Maritzburg, Natal, I. B. Pole Evans, 7.4.11 (1428); Mooi River, Natal, A. O. D. Mogg, 30.10.18 (12242). Oospores present in 12242.

Gerbera Jamesoni Bolus. Barberton, I. B. Pole Evans, 4.2.11 (1159): Pretoria, May, 1914, I. B. Pole Evans (7803); Johannesburg, A. Kelly, 17.3.17 (10020); Brooklyn, Pretoria, Mar., 1925, E. M. Doidge (20366).

Gerbera plantaginea, Harv., Garstfontein, Pretoria District, P. J. Pienaar, 20.12.11 (1986); Garstfontein, Miss J. Erasmus, 15.1.12 (2081).

The oospores present in Nos. 11325 and 12242 are of the medium type described by Magnus, with tubercles more distinct than in the common European form on *Scorzonera*, but not so prominent as in the form on *Cirsium* described by De Bary as *C. spinulosus*. In No. 12242 the oospores are sometimes larger than the measurements given for European and American forms of the species.

Cystopus Ipomoeae-panduranae (Schw.), *Stev.* and *Swingle* in "Trans. Kan. Acad. Sci.," II, 1889, p. 67.

Syn. *Albugo Ipomoeae-panduranae* (Schw.), Swing in Journ. Myc. 7, 1891, p. 112.
Cystopus Convolvulacearum Speg., Ann. Soc. Ci. Arg. 17, 1884, p. 128.
C. Convolvulacearum Otth. in Zalew. Bot. Cent. 15, 1883, p. 223.

Sori occurring on leaves or stems, whitish to pale-yellow, prominent and blister-like, on the leaves usually hypophyllous, and in small or large groups on discoloured areas. *Conidiophores* hyaline, clavate, 20–50 × 15 μ. *Conidia* all alike, cuboid, with equatorial thickening either slight or sometimes very marked, 15–20 × 12–18 μ. *Oospores* (not seen in South African material) borne on stems, causing distortion, yellowish-brown, 25–55 μ; epispore papillate or with irregular curved ridges.

On *Convolvulaceae* :—

Ipomoea cardiosepala, Hochst, Inanda, Natal, J. M. Wood (*Herb. Ke*
Ipomoea obscura, Tzaneen, Northern Transvaal, E. M. Doidge, 12.1.25 20338).
Ipomoea ficifolia, Tzaneen, Northern Transvaal, E. M. Doidge, 11.1.25 (20319).
Ipomoea sp., Barberton, I. B. Pole Evans, 4.2.11 (No. 1160).

Cystopus Bliti de Bary in "Ann. Sci. Nat.," Sér 4, t. 20, 1863, p. 131.

Syn. *Uredo Bliti* Bivon., Stirp. Rar. Sicilia III, 1815, p. 11.
Cystopus Amaranthi Berk. in Grevillea 3, 1874, p. 58.
C. Amaranthacearum Zalew., Bot. Cent. 15, 1883, p. 223.
C. Cyathulae Wint. in Roum. Rev. Myc. 11, 1889, p. 66.
Albugo Bliti Kuntze., Rev. Gen., Pl. 2, 1891, p. 658.

Sori on leaves, whitish or yellowish, prominent, 1–2 mm. diameter or larger by becoming confluent, prominent. *Conidiophores* hyaline, more or less cylindrical, 30–50 × 12–15 μ. *Conidia* of two kinds; the terminal sub-globose, slightly yellowish, with thick even walls, and slightly smaller than the others; fertile conidia elliptical or angularly obovate, sometimes truncate or umbilicate at the base, and with a strong internal equatorial thickening, 12–16 × 15–19 μ. *Oospores* (not seen in South African specimens) produced in leaves of host, dark-brown, about 55 μ diameter; epispore coarsely reticulate, with meshes 6–8 μ diameter.

In the absence of oosporic material on *Amaranthus Blitum*, which would assist in settling the question, the author has followed G. W. Wilson (Bull. Torr. Bot. Club, XXXIV, 1907, p. 77) in regarding *C. Amaranthacearum* Zalew as a synonym of *C. Bliti*.

On *Amaranthaceae* :—

Achyranthes aspera, Garstfontein, Pretoria District, P. J. Pienaar, 19.2.11 (1205); P. J. Pienaar, 26.3.11 (1310); E. M. Doidge, 11.4.11 (1477); Duivelskloof, Northern Transvaal, E. M. Doidge, 11.1.25 (20334).
Cyathula globulifera, Garstfontein, Pretoria District, P. J. Pienaar, 26.3.11 (1268).
Cyathula lappulacea, Somerset East, MacOwan, *ex Herb. Thuemen.* (*Herb. Kew*).
C. lappulacea, Somerset East, No. 1313, *ex Herb. Kalchbrenner* (*Kew*).

Cystopus quadratus *Kalchbr.* and *Cooke* in Grevillea ix, 1880, p. 22.

Syn. *Albugo quadrata* (K. and C.) Kuntze, Rev. Gen. Pl. 2, 1891, p. 658.

Sori hypophyllous, whitish, prominent and crowded, up to 1 mm. diameter. *Conidiophores* cylindrical or clavate, 40–60 × 15 μ. *Conidia* in long chains of two kinds, the terminal sub-globose, thick-walled, yellowish, 16–20 μ diameter; the rest cylindrical, with equatorial thickening, 18–22 × 16–20 μ.

On *Hypoestes verticillata* (*Acanthaceae*) :—

Cape, MacOwan, No. 1314 (*Kew Herb.*—type); Garstfontein, Pretoria District, P. J. Pienaar, 8.4.11 (1425).

The conidia resemble closely those of *C. Bliti*, but are somewhat larger. No oospores are present either in the type or in the more recent specimen, and in their absence it is not possible to say whether the species is really distinct.

Cystopus Evansii (*Syd.*) *Wakef.* comb. nov.

Syn. *Albugo Evansii* Syd. in Ann. Myc. x, 1912, p. 437.

Sori developed on leaves or stems, rounded or oblong, white, ½–1½ mm. in diameter. *Conidiophores* oblong-clavate, 35–45 × 14–17 μ, hyaline. *Conidia* of two kinds; terminal conidia sub-globose or globose, evenly thick-walled (1–2 μ), about 18μ in diameter, probably sterile; fertile conidia sub-globose or somewhat cylindrical, hyaline, with equatorially thickened membrane, 16–28 × 13–20 μ. Oospores not seen.

On leaves and stems of *Nemesia* sp.: Hoogfontein, Ladybrand District, Orange Free State, C. P. van der Merwe, 17.2.11 (1472). Co-type material examined.

SOUTH AFRICAN GRAMINEAE.

By SYDNEY M. STENT.

THE SOUTH AFRICAN SPECIES OF SPOROBOLUS.

HISTORY OF THE GENUS.

THE genus *Sporobolus* was founded by Robert Brown in 1810, and based on *Agrostis indica*, L. He describes three species—*Sporobolus indicus*, *Sporobolus elongatus*, and *S. pulchellus* (*R. Brown Prod.*, 1, p. 170). The characters of the new genus he describes as follows:—(Translated.) Glumes 2, 1-flowered, muticous, unequal, outer smaller. Valves of the perianth, muticous, minutely acute; sessile, beardless, longer than the glumes. Lodicules 2, hypogynous. Stamens 2–3. Styles 2. Stigmas villous. Seed (*cariopsis* Rich.) obovate, ventricose, free, deciduous.

Tropical grass rarely occurring beyond 35° latitude. Inflorescence paniculate. Mouth of the sheaths bearded, ligule obsolete.

Brown also included *Agrostis diandra* Retz. under the new genus, but retained *Agrostis virginica* L. under *Agrostis*, an account of the long upper glume.

Palisot de Beauvois, in his "Agrostographia," 1812, retained the genus *Sporobolus* practically as Brown established it. In his "Tabula methodica" it is placed under cohort I, spikelets 1-flowered. section 4; lower glume the smaller; valve muticous. He also included several grasses now valid under *Sporobolus* in his genus *Vilfa*, which he places in the same cohort as *Sporobolus*, but in section 3; lower glume the larger. valve with terminal bristle.

It is obvious that Beauvois did not know his species too well since he collected a very heterogenous lot of grasses under this genus *Vilfa*, many of which do not conform to his own limits of the genus.

In 1833 Kunth reconstituted the genus *Sporobolus* in a wider sense, and his conception of it has been more or less adopted by present-day botanists.

Trinius ("Agrost.," 1840), following after Kunth, accepted the limits of the genus as proposed by that botanist, but upheld Adanson's name *Vilfa* as being the older and therefore having priority.

Adanson's *Vilfa*, however, created in 1763, was based on *Agrostis stolonifera*, a true *Agrostis*, and did not in any way correspond to *Sporobolus* of Brown.

The name *Sporobolus* is therefore now unanimously accepted for this genus.

SPOROBOLUS, R. B. PROD.

Spikelets small ½–4 mm. long, quite glabrous, 1-flowered (in African species), variously paniculate, rhachilla very short, continuous with the pedicel, tardily disarticulating, only produced in one known species; flower hermaphrodite. *Glumes* equal or unequal, the lower often very small, 1-nerved or nerveless, emucronate, seldom keeled, persistent or caducous. *Valve* muticous, unawned, as long as or exceeding the glumes or sometimes very slightly shorter; 1–3-nerved, glabrous. *Pale* equalling the valve or a little shorter, 2-nerved, often canaliculate between the nerves, obtuse, truncate, emarginate or minutely bilobed, sometimes splitting to the base; callus minute, glabrous. *Stamens* 2–3. Styles short, distinct with plumose stigmas. *Lodicules* small, delicately hyaline, truncate. *Grain*

free and deciduous, or in some species attached by the base of the pericarp, which, ultimately bursting, ejects the seed: hilum basal, punctiform: embryo equalling half or less the length of the seed, pericarp delicate, loose, more or less swelling in water.

Perennial or sometimes annual grasses, blades flat, folded, or setaceously convolute, ligule a usually very short fringe of hairs. Panicles spikelike or open, often delicately effuse.

Nearest in affinity to *Agrostis*, which differs from it principally in the usually 5-nerved, rarely 3-nerved valves, always shorter than the equal or subequal glumes, and of a more delicate texture, and in the membranous ligule.

The spikelets of *Agrostis* are always a rather pale fresh green, while those of *Sporobolus* are usually from grey to dull yellow and brown.

KEY TO THE SPECIES.

Section 1.—*Eu. Sporobolus* (Stapf), rhachilla not produced.

Panicle when mature lax, broadly ovate, lanceolate or subpyramidal, seldom somewhat contracted, usually not more than four times as long as broad, if narrower then the spikelets 3–4 mm. long. [See (15) *artus*.]

Annual.

Culms up to 40 cm. long; leaves narrow linear; branches of panicle regularly whorled simple, 1–3 spiculate..... (1) *panicoides*.

Culms not more than 15 cm. long (usually much shorter); leaves short, blades ovate lanceolate; branches often many spiculate.

Culms up to 6 cm. high; leaves obtuse, margins minutely spinulous; spikelets appressed to the rhachis (2) *parvulus*.

Culms up to 15 cm. high; leaves acute, margins conspicuously rigidly ciliate; spikelets secund, pendulous..... (3) *discosporus*.

Perennial.

Culms not over 15 cm. high.

Panicle contracted, up to 5 cm. long; leaf blades acute subpungent..... (4) *albicans*.

Panicle open, lax; leaf blades very short with obtuse, truncate or emarginate tips..... (5) *tenellus*.

Culms usually over 15 cm. high.

All or at least the lowest branches of the panicle whorled (except sometimes in *S. artus*); pedicels short; spikelets more or less appressed to the branchlets (often spreading in *iocladus*).

Spikelets greyish-green, under 3 mm.

Culms usually about 16–20 cm. high; rhizome branched, covered with closely imbricating sheath bases, innovation shoots short; leaf blades short and narrow, not exceeding 3 cm. × 3 mm..... (6) *Ludwigii*.

Culms up to 40 cm. high; rhizome creeping, oblique or tufted, but not branched.

Basal sheaths becoming hard and shiny.

Branchlets of the panicle very short and appressed, therefore branches narrowly subspiciform above the base.

Leaves linear, under 3 mm. wide, margins straight, smooth, scaberulous or minutely spinulous..... (7) *Vryburgensis*.

Leaves ovate acuminate, flat, up to 5 mm. wide, with more or less undulate and spinulous ciliate margins..... (8) *nitens.*

Branchlets of the panicle up to 2 cm. long, spreading; basal sheaths light straw-coloured, up to 9 cm. long..... (9) *iocladus.*

Basal sheaths thinly membranous striate, not hardening.

Leaf blades ovate acuminate from a rather broad and clasping base, margins minutely but distinctly pectinate ciliate..... (12) *Smutsii.*

Leaf blades linear, tapering to a subobtuse apex from a scarcely wider base, margins scabrous, but not ciliate.

Innovation shoots densely crowded on oblique rhizome; leaves glaucous; spikelets obtuse rather less than 2 mm..... (10) *Gillii.*

Plant stoloniferous with few innovation shoots; leaves green; spikelets acute, 2 mm. or slightly more..... (11) *usitatus.*

Spikelets dark brownish-green or brownish-yellow, seldom grey, never less than 3 mm.

Basal sheaths membranous or thinly chartaceous, finely striate, not becoming hard and polished.

Panicle ovate, lax, open or somewhat contracted.

Panicle up to 7 cm. long; leaf blades narrow (not exceeding 3 mm. wide), rather flaccid, long, tapering to a setaceous point, ciliate or scabrid on the margins..... (13) *centrifugus.*

Panicle up to 17 cm. long; leaf blades wider (up to 5 mm.), rigidly nerved, flat, acutely acuminate, conspicuously ciliate..... (14) *pectinatus.*

Panicle contracted spikelike (Natal species)... (15) *artus.*

Basal sheaths firm, becoming hard and polished, outer ones not at all or obscurely striate.

Culms slender, sheaths narrow and rather tight; blades of the culm-leaves narrow and rather reduced.

Leaves setaceously convolute; basal sheaths pale to deep straw-coloured throughout.... (16) *filifolius.*

Leaves flat, basal sheaths tinged with brownish-red..... (17) *Tysonii.*

Culms stout; sheaths of the culm loose and up to 15 mm. wide; blades of the culm-leaves rather broad and well developed, especially the lower ones; panicle up to 18 cm. long.... (18) *laxevaginatus.*

Branches of the panicle solitary or binate, never whorled; spikelets on comparatively long, fine spreading pedicels.

Basal sheaths persistent, splitting into fibres.

Basal sheaths covered with tawny, fugacious curled hairs and forming a dense tuft of matted fibres at the base; axils of the panicle glabrous.. (19) *stuppeus.*

Basal sheaths more tardily splitting into fibres and not forming a matted fibrous tuft.
Axils of the panicle glabrous; leaves narrow, 2–4 mm. broad, margins finely cartilaginous, scaberulous..... (20) *festivus* var. *fibrosus*.
Axils of the panicle bearing tufts of fine white hairs; leaves not more than 1 mm. wide, with very much thickened margins..... (21) *micranthus*.
Basal sheaths not splitting into fibres; rhizome branched; blades short, subpungent; axils of the panicle bare..... (22) *acinifolius*.
Panicle long and narrow, usually much more than four times as long as broad (except in some specimens of *Fourcadii*), contracted or spikelike, or if rather broad and open then correspondingly long.
Both glumes equalling the length of the spikelet..... (23) *robustus*.
Upper glume more or less equalling the spikelet, lower shorter.
Panicle narrow, contracted, and spikelike; rhizome long creeping. Maritime plants..... (24) *virginicus*.
Panicle long, loosely spreading, or sometimes the branches more or less ascending, but never spikelike. Tufted grass (25) *fimbriatus*.
Both glumes shorter than the spikelet.
Panicle elongate, branches more or less spreading or ascending, not spikelike.
Branches few, solitary, scattered; rhizome shortly creeping..... (26) *Fourcadii*.
Branches solitary and irregularly crowded or subverticillate, spreading or obliquely ascending.
Culms rather stout; upper glume always obtuse and not exceeding half the spikelet. Tropical or subtropical grass..... (27) *pyramidalis*.
Culms more slender; upper glume often acute or subacute and exceeding half the spikelet. Grass of the coastal regions..... (28) *indicus* var. *laxus*.
Panicle very narrow, spikelike, sometimes interrupted.. (28) *indicus*.
Section 2.—*Chaetorhachia* (Stapf), rhachilla produced into a bristle half as long or as long as the spikelet. Only species.. (29) *subtilis*.

1. **S. panicoides,** Rich. (Flor. Abyss. II, 399).

Annual tufted. *Culms* slender, branched, glabrous, up to 40 cm. long, 4–5-noded, lowest internode short, succeeding gradually longer and more or less exserted: *sheaths* of the leaves thin, loose, narrow, sulcate compressed and keeled, glabrous except along the often softly ciliate margins and at the mouth, ligule ciliate: *blades* narrow linear, attenuating to a long, fine acute point, flat or folded, up to 16 cm. long × 5 mm. wide, thin and flaccid, glabrous, finely scaberulous above and on the margins, smooth beneath, keeled in the lower portion, with 3 primary lateral nerves on either side the midrib. *Panicle* quite glabrous, narrow oblong to ovate, open, 8–20 cm. long × 4–6 cm. broad; *branches* simple, 1–3 spiculate, regularly verticillate, lowest whorl of 12–20 branches up to 3 cm. long and ascending or spreading, those of the succeeding whorls usually fewer and rather shorter: lateral pedicels very short, clavate. *Spikelets* 3 mm. long, narrow, ovate acuminate, greenish-yellow, flushed with purple; *glumes* very unequal, *lower* equalling about 0·3 of the spikelet, ovate acuminate, thinly membranous, flushed with purple at the base, nerveless; *upper* equalling or slightly exceeding the spikelet and clasping it

at the base, 1-nerved, ovate acute, the margins reflexed towards the tip so that the glume appears to be narrowly acuminate, flushed with purple at the base and towards the tip, smooth; *calyx* resembling the glume, often faintly 3-nerved; *pale* equalling the valve, rather broad truncate or emarginate at the tip, scaberulous towards the base, 2-nerved, folded down the centre and easily splitting to the base; *stamens* 3, anthers 1 mm. long; *lodicules* short, truncate; *ovary* ovate on a short gynophore; *stigmas* distinct, short; *grain* globose, reddish-brown to pale straw-coloured, *embryo* equalling less than 0·5 of the grain, dark, *hilum* punctiform; pericarp swelling and dehiscing in water; *testa* mucilaginous.

Plate I.
Sporobolus parvulus Stent.

Pretoria Dist.: Bushveld on Farm Rooikop, *Smuts* (in *Nat. Herb.* 2874); Zoutpansberg Range, N. Transvaal, *Smuts* (in *Nat. Herb.* 2879).

A tropical grass recorded for the first time within the Union.

2. **S. parvulus,** Stent, n. sp.* [Plate I.]

Small annual. *Culms* up to 6 cm. long, ascending, slender, smooth, glabrous, 1-noded; *basal sheaths* loose, up to 5 mm. long, thinly membranous, sulcate, glabrous; with a few rigid acute tubercle-based bristles on the margin near the mouth, culm sheaths tight, up to 20 mm. long; *lupule* a rather irregular fringe of hairs; *blades* ovate lanceolate, flat or folded, up to 12 mm. long × 2·5 mm. wide, rounded and somewhat clasping at the base, narrowing to an obtuse apex, glabrous, finely ribbed and scaberulous on the upper surface, smooth below, margins cartilaginous and minutely spinulous. *Panicle* ovate to lanceolate, 16–22 mm. long × 10–16 mm. wide; lowest *branches* 3–5 in a whorl, upper whorled, binate

*Latin diagnoses of new species arranged alphabetically at the end of the paper.

or solitary, undivided for half their length, branchlets short, appressed 1–3 usually 2 spiculate, lateral pedicels very short; *spikelets* dark olive-green, lanceolate, 1 mm. long; *glumes* very unequal, *lower* very small, hyaline, ovate obtuse, 0·3 mm. long, nerveless, *upper* ovate, lanceolate, subacute, the length of the spikelet, 1-nerved; *valve* resembling the upper glume, 1-nerved; *pale* bilobed, and toothed at the apex, very readily splitting to the base; *stamens* 3, anthers 0·4 mm. long, ovate; *caryopsis* 0·7 mm. long, pericarp swelling in water.

Orange Free State.—Boshof Dist.: Smitskraal, *Burtt-Davy* 10127 (in *Nat. Herb. Pret.*).

Near to *S. tenellus*, from which it differs in the larger upper glume, smaller panicle with appressed branchlets, annual habit, and laxer and more distant leaves. *Kensit* in *Herb. Bolus* 17638, from Mortimer, Cape Province, is an annual that resembles this very closely, but is larger in all its parts, the culms reaching a height of 10·5 cm., with panicles 3 cm. × 3 cm. The spikelets are rather lighter-coloured. It is possible that Burtt-Davy's plant, from which I have described the species, is a somewhat dwarfed specimen; there are, however, six or seven plants on the sheet all representing the same form. I hesitate to include Kensit's plant, coming as it does from a very different part of the country, till I have more material.

3. **S. discosporus,** Nees (Fl. Afr. Austr., 158).

Annual. *Culms* 4–15 cm. long, slender, glabrous, smooth, erect or geniculate, 1–2-noded; *basal sheaths* short, thinly membranous between the conspicuous ribs, glabrous, 4–5 mm. long, those of the culms narrow, tight, sulcate, rather shorter than the internodes; *ligule* a fringe of hairs; *blades* linear or lanceolate acute, very short, 4–15 mm. long and 4 mm. wide, that of the uppermost internode often much reduced, glabrous, smooth, finely and closely striate, margins cartilaginous, subserrate and ciliate, with rigid acute bristles about 1·5 mm. long. *Panicle* erect, ovate to lanceolate, lax, 2–5 cm. long × 1·5–3 cm. wide; *branches* verticillate, patent, undivided for about half their length. *Spikelets* secund, drooping, 1·3 mm. long, dark olive-green: *glumes* very unequal, *lower* equalling about one-third the spikelet, delicate, narrow ovate acute, nerveless, *upper* equalling the spikelet, broad, concave, acute, 1-nerved, nerve usually purplish, scabrid; *valve* like the glume, faintly 1-nerved; *pale* as long as the valve; *stamens* 3, anthers 0·3 mm. long; *caryopsis* flat, round, lenticular, 1·2 mm. long.

Cape Province.—Knysna Div.: Between Plettenberg Bay and Flats Station, *Burchell* 2750 (*Alb. Mus. Herb.*). Aliwal North Div.: On stony plateau at Kraai River, *Drège* (*Herb. Mus. Austr. Afr.*). Basutoland: Leribe, *Dieterlen* 660 (*Natal Herb.* 13784 and *Herb. Mus. Austr. Afr.* 6329). Veld, Kimberley, *Wilman* (*Herb. Bolus*). Hay Div.: Tyger Kop, *Wilman* (*McGreg. Mus.* 2205 and *Herb. Bolus*).

Orange Free State.—Winberg, Hay, *Galpin* 7737 (in *Nat. Herb. Pret.*); Bloemfontein, Quaggafontein Pan, *Potts* 2446 (*Nat. Herb. Pret.*); Vereeniging, *Burtt-Davy* 15200 (*Herb. Bolus*).

Transvaal.—Bloemhof Dist.: Holwater, near Christiana, *Burtt-Davy* 11233; Kaffraria, near Christiana, *Burtt-Davy* 11409, 12778, 11389. Pretoria Dist.: Irene, near Pretoria, *Burtt-Davy* 14657, *Pole Evans* 221; Kaalfontein, *Mogg* 3740. (All in *Nat. Herb. Pret.*). Sixmilespruit, near Pretoria, *Schlechter* 3580 (*Alb. Mus. Herb.* and *Herb. Pret. Mus.*).

Nees, in his original description of this plant, gives it as annual. Stapf, however, in the "Flora Capensis," describes it as a tufted perennial with short barren shoots from the base of the culms. All the plants I have examined are undoubtedly annual, and the original description is therefore the correct one.*

*After this revision had gone to press, Mr. C. A. Smith brought me specimens of a *Sporobolus* collected by him at Victoria West, Cape Province (*Smith* 2429 in *Nat. Herb. Pret.*). These I identified as *S. argutus* Kunth, a South American annual that has probably been introduced into this country with forage, etc., as have so many of our weeds. There is no doubt that *Bolus* 17638 from Mortimer, Cape Province, is the same species, and very little that Burtt-Davy's specimens from Smitskraal, on which I have founded my new species *S. parvulus*, is merely a very dwarfed form of the same.

S. argutus agrees with the description of *S. parvulus* in every detail except as to measurements. The culms of the former are up to 30 cm. long and 2-noded, the panicle 4–6 cm. long and 3–4 cm. wide, the lowest whorl consisting of 8.12 or more branches. The spikelets are slightly larger

4. **S. albicans,** Nees (Fl. Afr. Austr., 154).

Perennial, tufted. *Culms* 3–15 cm. long, erect, glabrous, smooth, 1-2–noded, sheathed almost all along; *basal leaves* densely imbricate; *sheaths* glabrous, smooth, the lower short and broad, upper long, very tight; *ligules* a ciliate rim; *blades* lanceolate to linear, usually involute towards the tips and subpungent, the lowest 6 mm. × 2 mm. in the lower part, the upper up to 3 mm. broad; rigid, glabrous, smooth below, densely white papillose above, with rigid white cartilaginous margins. *Panicle* contracted, spikelets 3–5 cm. long, erect; *branches* solitary, up to 18 mm. long, filiform, laxly-branched and smooth, pedicels capillary as long as the spikelets or longer. *Spikelets* rather over 2 mm. long; *glumes* unequal, hyaline, the *lower* oblong, obtuse, nerveless, equalling about half the spikelet, *upper* lanceolate oblong, obtuse to subacute, 1-nerved, slightly shorter than the spikelet; *valve* 3-nerved, oblong obtuse, concave; *pale* slightly shorter; *stamens* 3, anthers 1 mm. long; *caryopsis* obliquely obovate, sub-compressed, 1 mm. long, pericarp swelling in water, testa mucilaginous, albumen opaque.

Cape Province.—Queenstown Div.: Between Table Mountain and Wildschutz Berg, 4,000 ft., *Drège.*

This species has apparently never been collected since Drège collected it nearly a century ago, and his is the only record we have of it.

The construction of the spikelets, the character of the leaves, and general habit of the plant would suggest *Sporobolus acinifolius*, Stapf, from which it only differs in the very short culm and short contracted panicle.

5. **S. tenellus,** Kunth. (Enum. 1.215).

Perennial, densely caespitose with a much branched rhizome, branches short, densely covered with the imbricated sheaths and sheath bases; *culms* erect or ascending, very slender, 4–15 cm. long, glabrous, smooth, 1-noded: *sheaths* of the barren shoots, and basal leaves short, broad, firm, smooth, of the culm leaves tight, narrow, and finely striate; *ligule* a minutely ciliate rim; *blades* ovate to linear, with a broadly obtuse truncate or emarginate tip: 3-8 mm. long × 1–2·5 mm. broad, rigid, flat or folded, papillose or scaberulous above, finely and closely striate, margins cartilaginous and smooth. *Panicle* lax, erect, ovate, 2·5 4 cm. long; *branches* solitary, obliquely spreading, branched from about the middle, branchlets divaricate, pedicels about twice as long as the spikelets. *Spikelets* pallid or purplish with yellowish tips, up to 1·8 mm. long: *glumes* ovate, obtuse to subacute, *lower* equalling less than half the spikelet, nerveless, hyaline, *upper* rather more than half the spikelet, hyaline at the tips, firmer below, 1-nerved: *valve* obtuse, strongly 3-nerved; *pale* equalling the valve; *stamens* 3, anthers 1 mm. long.

Cape Province.—Beaufort West Div.: Beaufort, *Zeyher* (in *Alb. Mus. Herb.*); Middelburg, *Sim* (*Alb. Mus. Herb.* 2701).

Orange Free State: Boshof, *Burtt-Davy* 12399 (in *Nat. Herb. Pret.*); Hanover, *Sim* 5263 (in *Herb. Bolus*) Rosmead Junction *Sim* 5637 (in *Herb. Bolus*) Victoria West Div.: Hutchinson, *Burtt-Davy* 17591 (in *Nat. Herb. Pret.*).

6. **S. Ludwigii,** Hochst. (in Flora, 1846, 118).

Perennial, rhizome creeping, covered with the persistent imbricate sheath bases, barren shoots crowded, short, stout, and closely sheathed. *Culms* very slender, 13–30 cm. long, 1–3-noded, glabrous, smooth, uppermost internode long exserted: *sheaths* of the barren shoots and culm bases closely imbricate, short, broad, firm, pallid, smooth, and finely striate, sometimes obscurely so, those of the culms tight and striate, shorter than the internodes: *ligule* a densely ciliate rim of hairs up to 1 mm. long: *blades* linear lanceolate, acuminate, subacute, finely ribbed, the lower 1–3 cm. long × 2–3 mm. wide: the upper ones rudimentary, flat, often curled or undulate, glabrous, smooth below, scaberulous above, with scabrid or smooth cartilaginous margins. *Panicle* erect, ovate, acute, lax, 3–8 cm. long × 2–5 cm. broad; the lowest *branches* whorled, the upper ones in

sub-whorls or solitary, obliquely erect or widely spreading, undivided for from 5–15 mm. from the base, branchlets 2–4 spiculate, lateral pedicels very short. *Spikelets* close, secund, rarely the branchlets alternate, dark olive or greyish-green, 1·5–2 mm. long; *glumes* very unequal, *lower* ovate, obtuse, hyaline, 0·5 mm. long, *upper* oblong obtuse, 1-nerved, 1·5 mm. long; *valve* like the upper glume; *pale* slightly shorter than the valve; *stamens* 3, anthers 1–1·5 mm. long; *grain* not seen.

Cape Province.—Graaff-Reinet Div.: On stony hills at Sundays River, *Drège* (in *Herb. Mus. Afr. Austr.*). Griqualand West, in veld near Dutoitspan, *Tuck* (in *Herb. Mus. Afr. Austr.*). Vryburg, Elmar, *Burtt-Davy* 14056*a* (in *Nat. Herb. Pret.*).

Orange Free State.—Boshoff Dist.: Smitskraal, *Burtt-Davy* 10125, 12950 (in *Nat. Herb. Pret.*).

Transvaal.—Bloemhof Dist.: Christiana, *Burtt-Davy* 12809, 12498 (in *Nat. Herb. Pret.*). Potchefstroom, *Burtt-Davy* 847*a* (in *Nat. Herb. Pret.*).

A short-leaved spreading grass of the dry sandy regions of the Karroo and Thornbelt.

7. **S. vryburgensis,** Stent, n. sp. [Plate II.]

Tufted perennial, sometimes sending out rather stout, many noded stolons. *Culms* erect or geniculate, up to 60 cm. long, slender, glabrous, smooth, 2–3-noded, simple or more usually branched from the lower nodes; *sheaths* of the barren shoots about 4 cm. long, narrow, chartaceous, sub-compressed, faintly sulcate, pallid, glabrous, smooth; *ligule* a fringe of white hairs up to 1 mm. long; *blades* narrow linear, 2–3 mm. wide × 10 cm. long (or those of the barren shoots often shorter, narrower, and more rigid), flat or folded, smooth below, covered with minute blunt papillae above, scabrid on the margin, midrib rather stout, with primary lateral nerves 1–2 on either side. *Panicle* ovate acuminate, up to 13 cm. long × 6 cm. broad, lowest *branches* verticillate, the succeeding sub-verticillate or solitary, obliquely or occasionally widely spreading, mostly undivided for from one-third to half their length, the uppermost very short, more or less appressed and divided from the base, smooth or minutely scabrid, mottled with purple; branchlets very short, appressed, and more or less secund. *Spikelets* dark grey, 2 mm. or slightly more or less, shortly pedicelled or sessile, secund; *glumes* unequal, *lower* narrow oval obtuse or subacute, delicately hyaline, nerveless, equalling about half the spikelet, *upper* equalling or slightly exceeding and embracing the spikelet, obtuse or subobtuse, scaberulous on the back or smooth, 1-nerved, the nerve sometimes minutely excurrent; *valve* equalling the upper glume, obtuse or minutely emarginate, 1-nerved, scabrid on the keel or smooth; *pale* equalling the valve, 2-nerved, bilobed or emarginate; *stamens* 3, anthers 1·2 mm.; *caryopsis* ovate, compressed, 1 mm. long, albumen white, granular; pericarp very delicate, swelling in water.

Cape Province.—Vryburg Div.: Armoedsvlakte, near Vryburg, *Foley* (in *Nat. Herb. Pret.* 2825), *Mogg* 8828.

Transvaal.—Lichtenburg Dist.: Barberspan, *Pole Evans* 320 (in *Nat. Herb. Pret.*).

8. **S. nitens,** Stent (Bothalia, I, 281).

Perennial from oblique rhizome. *Culms* erect or prostrate ascending, sometimes rooting and branching from the lower nodes, compressed below, glabrous, shining, 1–2-noded, 13–30 cm. high, and sheathed almost to base of inflorescence; *sheaths* tight, striate, smooth, glabrous except along the margins, which are often hairy with tubercle based hairs, basal sheaths short, compressed, straw-coloured, very firm, shining, and persistent; *ligule* a densely ciliate rim; *blades* up to 6 cm. long × 7 mm. broad, seldom longer or broader, rounded and more or less clasping at the base, tapering to an obtuse or subacute apex, flat, very firm and finely ribbed, margins undulate, cartilaginous and minutely pectinate, glabrous or with a few tubercle based hairs, minutely scaberulous. *Panicle* ovate to lanceolate, 6–10 cm. long and 2·5–4 cm. broad, rachis and branches smooth; lowest *branches* whorled and ascending, seldom some or all of them spreading, the others single or in pairs arranged spirally on the axis, undivided for from half to two-thirds of their length, except

Plate II.

Sporobolus vryburgensis Stent.

the uppermost ones, which are very short and branched almost from the base; branchlets very short, more or less secund, appressed, 1–5 spiculate; pedicels very short. *Spikelets* 1·5 mm. long, secund; *lower glume* oblong, lanceolate, acute to subacute, nerveless, 1 mm. long; *upper glume* 1·5 mm. long, ovate acuminate, strongly 1-nerved, minutely pectinate ciliate on the keel; *valve* equalling or slightly exceeding the upper glume, strongly 1-nerved, acutely acuminate, smooth; *pale* equalling the valve, broad, narrowing to a bilobed tip, soon splitting to the base; *anthers* 3, reddish, about 0·4 mm.; *lodicules* oval, minute; *fruit* oval to round, pericarp swelling and bursting in water, testa not mucilaginous.

In the plain at the foot of the Magaliesberg Mountains, *Schlecht.* 3679: Rooikop Bushveld, Pretoria Dist., *Pole Evans* 667 (in *Nat. Herb. Pret.*); Gezina, Pretoria, *Fouche* and *Stent* (in *Nat. Herb.* H. 21445).

Cape Province.—Albany Dist.: Near top of Koonap Heights, common along road, *Schonland* 3705 (in *Nat. Herb.* and *Herb. Alb. Mus.*).

Useful as a crop for sheep, but otherwise of little agricultural value.

9. **S. iocladus,** Nees (Fl. Afr. Aust., 161).

Perennial, densely tufted, rhizome oblique. *Culms* geniculate ascending, up to 60 cm. long, 2–4-noded, simple or occasionally with a branch from the lower or middle node; *basal sheaths* firm with thinner membranous margins, pallid, up to 10 cm. long, glabrous or hirsute; *ligule* densely ciliate; blades linear, narrow, 3–17 cm. long and 2–4 mm. wide, flat or convolute, tapering to a setaceous apex, glabrous or hairy, smooth below, and scaberulous above or scaberulous all over. *Panicle* erect, ovate lanceolate, 10–15 cm. long and up to 12 cm. broad, rachis smooth, slender, terete and striate, glabrous, lowest branches in a whorl of 7–9 obliquely ascending or widely spreading, the rest whorled, sub-whorled or solitary, longest up to 6 cm. long, divided from near the base or from 1–2 cm. above it, branchlets spreading, short, filiform, up to 2 cm. long, pedicels short. *Spikelets* greyish-green to dark olive-green, narrow, 2 mm. long; *glumes* very unequal, *lower* small, equalling one-third of the spikelet or less, nerveless or faintly nerved, broadly ovate obtuse, *upper* equalling or slightly exceeding the spikelet, oblong obtuse when flattened out, acute or subacute in profile, 1-nerved, slightly keeled, with reflexed margins at the tip; *valve* like the upper glume; *pale* slightly shorter; *stamens* 3, anthers 1 mm. long; *fruit* linear oblong, 0·75 mm. long.

Cape Province.—Uitenhage Div.: Steenbokvlakte, *Ecklon* and *Zeyher* (*Alb. Mus. Herb.* and *Herb. Mus. Aust. Afr.*). Somerset East, in stony ground at Biesjesfontein, near Loots Kloof, *MacOwan* 1609 (*Alb. Mus. Herb.*). Graaff-Reinet, Klipfontein, *Burtt-Davy* 13526 (*Nat. Herb. Pret.*). Hanover, *Sim* 6262 (*Nat. Herb. Pret.*). Oudtshoorn Div.: Near Congo, on dry kopjes, *Bolus* 12428 (*Herb. Bolus*). West Cradock, *Holland* (*Herb. Bolus*).

Transvaal.—Bloemhof Dist.: Banks of the Vaal, *Burtt-Davy* 1507 (*Natal Herb.* 12646).

The sheet in the Bolus Herbarium labelled *Bolus* 12428 bears under one number two plants presumably from one gathering. One plant typical *iocladus*, but the other has more or less appressed branchlets and spikelets very slightly more than 1 mm. long, with a comparatively smaller and narrower lower glume, otherwise it is typical.

10. **S. Gillii,** Stent, n. sp.

Perennial, rhizome oblique, densely beset with short barren shoots. *Culms* geniculate, ascending 30–45 cm. high, slender, glabrous, 2–3-noded, occasionally rooting from the lowest node, more or less compressed; *sheaths* glabrous, compressed or sub-compressed, the lower short, pallid, thinly membranous, upper green, narrow, rather tight, shorter than the internodes, finely ribbed; *ligule* a fringe of hairs; *blades* flat, glabrous, smooth or minutely scaberulous on the underside and margins, 2–3 mm. broad × 4–5 cm. long, tapering to a minutely obtuse apex, glaucous, finely ribbed, midrib slender, white. *Panicle* ovate lanceolate, acute, about 9 cm. long × 4–5½ cm. broad; branches whorled, spreading or the lower obliquely ascending, smooth, undivided for some distance above the base,

branchlets short, spreading or appressed, 2–3 spiculate; pedicels short to very short, the lateral spikelets often subsessile. *Spikelets* small, dark greenish-grey, acute before anthesis, then somewhat gaping and obtuse, 1·5–1·75 mm. long; *glumes* very unequal, *lower* very small, equalling 0·3 of the spikelet or much less, delicate, hyaline, nerveless, *upper* broad, equalling or rather shorter than the spikelet, 1-nerved; *valve* resembling the lower glume, 1-nerved, broadly obtuse; *pale* broad, emarginate, loosely folded down the centre; *anthers* 3·1 mm. long; *styles* short, stigmas plumose; *grain* not seen.

Cape Province.—Middelburg, Grootfontein, *Gill* 7 (in *Nat. Herb. Pret.*).

Near to *S. iocladus*, from which it differs in the thin, short basal sheaths, shorter panicle, more obtuse spikelets, and also in the internal structure of the leaf.

11. **S. usitatus,** Stent, n. sp. [Plate III.]

Perennial; stoloniferous. *Culms* geniculate, often prostrate, ascending, 30–45 cm. long, glabrous, smooth, terete or sub-compressed in the lower part, slender, uppermost internodes long, sheathed to above the middle, the lower ones all short and sheathed to near the top; *lower sheaths* thinly membranous, glabrous, compressed, keeled, striate soon withering; upper firmer in texture, tight, sub-compressed and keeled, glabrous, finely striate; *ligule* a fringe of hairs; *blades* linear, tapering to a narrow subobtuse folded apex, green, glabrous, scabrous and minutely spinulous-ciliate on the cartilaginous margins, scaberulous on the underside towards the tip, about 4 mm. broad up to 8 cm. long, those of the barren shoots often slightly wider and shorter. *Panicle* ovate acuminate, up to 9 cm. long × 4–5 cm. broad, somewhat contracted or spreading; branches verticillate or occasionally the upper ones solitary, purple, delicate, smooth or scaberulous, undivided for from half to one-third of their length; branchlets short, 1–4 spiculate. *Spikelets* on short appressed pedicels, subsecund, 2–2·3 mm., greyish-green; *glumes* very unequal, *lower* narrow oval, obtuse, nerveless, subhyaline, equalling less than half the spikelet, *upper* the size of the spikelet, dark grey-green, strongly 1-nerved, subacute; *valve* like the upper glume, but slightly shorter; *pale* equalling the valve, delicate, and easily splitting; *anthers* purplish, 1·2 mm. long; *fruit* not seen.

Cape Province. -Hay Div.: The flats, Tyger Kop, *Wilman* (in *Herb. Bolus* 17637); Bermolli, *Wilman* (*Herb. Bolus*).

Transvaal.—Meintjes Kop, Pretoria, *Stent* (in *Nat. Herb. Pret.* H. 21624).

Not a very distinctive species, near to *S. Ludwigii*; it occurs plentifully in association with *Eragrostis, spp.*

12. **S. Smutsii,** Stent (Bothalia, I, 281).

Perennial. *Culms* prostrate, ascending, glabrous, many noded and often branched and rooting from the lower nodes, which are short, exserted; *barren shoots* often long, many and shortly noded, and leafy; *sheaths* short, membranous, keeled, tight, glabrous except at the bearded mouth and sometimes finely ciliate margins, or with a few scattered tubercle based hairs, finely striate, lower ones reddish; *ligule* a densely ciliate rim up to 1·5 mm. long; *blades* lanceolate, broadly clasping at the base and narrowing to an obtuse apex, 2·5–8 cm. long and 4–7 mm. wide, rigid, flat, glabrous, or hairy with tubercle based hairs, margins thick, cartilaginous, and pectinate, with small rigid, broad based, acute, ascending hairs, scabrid all over or quite or nearly smooth. *Panicle* erect, ovate, lanceolate, acute (rarely contracted into a spikelike inflorescence), 2–4 cm. broad and 8–10 cm. long; *branches* in whorls, or the upper ones more or less scattered, lowest up to 3·5 cm. long, undivided for from 0·5–1·25 cm., usually ascending, upper ascending spreading; branchlets short, up to 3 mm. long, more or less secund and appressed; *pedicels* very short. *Spikelets* 1·7–2 mm. long, greenish-grey, oblong, obtuse; *lower glume* small, 0·6 mm. long, delicate, nerveless and obtuse; *upper* equalling the spikelet distinctly 1-nerved, acute or subacute, boat-shaped with rounded keel; *valve* resembling upper glume, subacute, 1-nerved; *pale* truncate when expanded; *anthers* 3, 1·25 mm. long; *lodicules* truncate, minute; *grain* (?).

Plate III.

Sporobolus usitatus, Stent.

Transvaal.—Pretoria Dist.: Rooikop Bushveld, *Pole Evans* 590 and 271 (in *Nat. Herb. Pret.*); Mosdene, Naboomspruit, Waterberg, *Galpin* M. 682 (in *Nat. Herb. Pret.*).

A very characteristic grass with its decumbent ascending habit and short, broad, flat leaves on leafy runners.

13. **S. centrifugus** Nees (Fl. Afr. Austr., 158).

Perennial, tufted. *Culms* slender, up to 37 cm. high, glabrous, smooth, 1–2-noded, simple; *basal sheaths* short, densely imbricating, rather thin, finely striate, persistent, upper tight, glabrous; *ligule* a narrow ciliate rim; *blades* narrow linear, flat or involute, tapering to a setaceous point, 2–3 mm. wide, 4–8 cm. long, the upper ones usually much reduced, glabrous except on the often pectinate ciliate margins. *Panicle* erect ovate, open or more or less contracted, 2·5–4 cm. wide and up to 10 cm. long; *branches* verticillate or the uppermost binate or solitary, filiform, undivided in the lower half, branchlets and pedicels very short, appressed. *Spikelets* few or rather crowded towards the tips of the branches, olive-brown with usually shining yellowish margins to the glumes, slightly over 3 mm. long; *glumes* unequal or subequal, *lower* narrow, 1-nerved, acutely or obtusely acuminate, equalling three-quarters or more of the spikelet, *upper* broader, equalling or more usually exceeding the spikelet; *valve* ovate, subacute, 1-nerved; *pale* equalling the valve truncate or broadly obtuse; *anthers* 3, 1·5 mm. long; *fruit* not seen.

Cape Province.—Transkei: Between Gekau and Bashee, *Drège* (*Herb. Mus. Afr. Aust.*). Basutoland: Leribe, *Dieterlen* 671 *ex parte*.

Transvaal.—Near Lydenburg, *Schlechter* 3965 (*Herb. Alb. Mus.* and *Nat. Herb. Pret.*).

Nees quotes Drège's specimens from the Transkei as the type of his var. *β augusta* (Nees, Fl. Afr. Austr., 159), but the sheet in the Albany Museum Herbarium bearing Drège's label agrees with his description of var. *α* and not of var. *β*, and it would appear that Nees made a mistake in recording his localities. I have not seen Drège's plants from the Windvogel Mountain, in Cathcart Division, nor from the Witte Bergen, Aliwal North, which Nees quotes as types of his var. *α*.

14. **S. pectinatus,** Hack. (Oestr. Bot. Zeitschr., LIII, 198).

Perennial; rhizome oblique. *Culms* erect, rather slender or sub-robust, up to 40 cm. long, terete, glabrous, smooth, 2-noded, simple; *basal sheaths* densely imbricating, not exceeding 4 cm. long, usually much shorter, pallid, chartaceous, finely striate, with finely pectinate margins; upper sheaths rather tight, glabrous, green, with smooth margins; *ligule* a narrow ciliate rim; *blades* mostly crowded at the base, linear, tapering to an acute apex, flat or folded, up to 12 cm. long × 6 mm. wide, often much shorter, rigidly nerved, smooth or rarely scaberulous, pectinate ciliate on the margins with rigid tubercle based bristles. *Panicle* ovate-acute, open or somewhat contracted, up to 17 cm. long and 8 cm. broad; lowest internode about 3 cm. long, succeeding ones gradually decreasing; *branches* verticillate, filiform, smooth, obliquely ascending or more or less spreading, undivided for from two-thirds to three-quarters of their length, branchlets and pedicels very short and crowded towards the tips. *Spikelets* lanceolate, acute, about 3 mm. long, dark brownish-green; *glumes* unequal, *lower* equalling half the spikelet, ovate lanceolate, subacute, nerveless or faintly 1-nerved, *upper* equalling the spikelet, lanceolate, acute, 1-nerved; *valve* like the upper glume; *pale* oblong obtuse, 2-nerved; *anthers* 3 (rarely 2); *fruit* ovate, 1·5 mm. long, narrowed to the base, pericarp swelling in water.

Cape Province.—George, Christina Bay, *Schlechter* 2453 (in *Alb. Mus. Herb.*, *Herb. Mus. Austr. Afr.* 17860, and *Herb. Bol.*).

Transvaal.—Pretoria: Derdepoort, *Fouche* (in *Nat. Herb. Pret.*). Witwatersrand: Doornkloof, Irene, *Pole Evans* 367 (*Nat. Herb. Pret.*); Johannesburg, *Paterson* (*Alb. Mus. Herb.*), *Rogers* 1396 (*Alb. Mus. Herb.*), *Burtt-Davy* 3097 (*Nat. Herb. Pret.*), *Hutton* 253 (*Alb. Mus. Herb.*). Lydenburg, *Schlechter* 3965 (*Herb. Trans. Mus.* 19644). Carolina: Leeuwpoort, *Burtt-Davy* 7736, 2990 (*Nat. Herb. Pret.*). Zoutpansberg: Downs, open veld, *Junod* 4091 (*Nat. Herb. Pret.*).

Bears a close resemblance to *S. centrifugus*, from which it differs in the broader, flat or folded rigidly pectinate leaves as well as in the shorter lower glume. Hackel places it nearest in affinity to *S. iocladus*, having obviously overlooked the much more nearly related *S. centrifugus*.

15. **S. artus,** Stent, n. sp. [Plate IV.]

Tufted perennial, rhizome oblique. *Culms* erect, slender, glabrous, smooth, striate, 1–2-noded, 26–46 cm. long; *basal sheaths* rather broad, imbricate, thin, rather firm, glabrous, finely and closely striate; clum sheaths narrow, tight, glabrous, smooth, finely striate, exceeding or sometimes a little shorter than the internodes; *ligule* a minutely ciliate rim; *blades* narrow linear, about 3 mm. wide at the base, tapering to an obtuse or subobtuse point, finely sulcate, and smooth below, smooth or finely scaberulous above, flat or involute towards the tip, margins scaberulous. *Panicle* contracted, spiciform, up to 15 cm. long; *branches* scattered or subverticillate, short, closely appressed, or the lower ones slightly spreading. *Spikelets* light olive-green, about 5 mm. long; *glumes* unequal, *lower* about two-thirds the spikelet, linear oblong, obtuse, nerveless or faintly 1-nerved, *upper* equalling the spikelet, obtuse, faintly 1-nerved, scaberulous all over on the back, sub-bicarinate in the upper half; *valve* like the upper glume; *pale* equalling the valve, faintly 2-nerved truncate when expanded, canaliculate down the back; *stamens* 3, anthers 2·3 mm. long; *lodicules* rather large for the genus, 0·5 mm. long and broad, 3-nerved; *fruit* about 1·5 mm. long, oval (only immature one seen).

Natal Province.—Without precise locality, *Wood* 6009 (in *Natal Herb.*); Inanda, *Rehmann* 8254 (*Herb. Alb. Mus.*). *Wood* 1578 (*Herb. Alb. Mus.*); Claremont, *Schlechter* 3044 (*Herb. Alb. Mus.*); Phoenix, *Schlechter* 3128 (*Herb. Alb. Mus.*); Winkelspruit, *Wood* 11894 (*Herb. Mus. Austr. Afr.* 7391 and *Herb. Bolus*). Zululand, *Buchanan* 300 (*Herb. Bolus*). Drakensberg, near Newcastle, *Buchanan* 176 (*Herb. Bolus*).

Rehmann 8254 and *Wood* 1578 are quoted by Stapf in the "Flora Capensis" under *S. centrifugus* var. *angustus*.

16. **S. filifolius,** Stent, n. sp. [Plate V.]

Perennial, densely tufted, with numerous innovation shoots on an oblique rhizome. *Culms* slender, simple, smooth, glabrous, up to 40 cm. high, 1–2-noded, lower internodes short, erect, or subgeniculate; *basal sheaths* short, glabrous, firm, pale or deep straw-coloured, polished smooth, those of the culm narrow, striate, somewhat loose, glabrous except along the sometimes softly ciliate margins and at the mouth; *ligule* a narrow ciliolate rim; *blades* very narrow, filiform, convolute, up to 16 cm. long, smooth or minutely scaberulous on the margins. *Panicle* narrow ovate, contracted or somewhat open, up to 9 cm. long × 2·5 cm. broad, often narrower and almost spiciform, lowest internode rather long, sometimes equalling nearly half the panicle; *branches* verticillate, filiform smooth, erect or obliquely erect, lowest up to 4·5 cm. long, undivided to about the middle, branchlets and pedicels short, erect, the latter rarely longer and equalling the spikelet. *Spikelets* from a dark greyish-yellow to olive-brown, 3–4 mm. long, acuminate; *glumes* unequal to subequal, *lower* equalling three-quarters to more of the spikelet, narrow, acutely acuminate, usually prominently 1-nerved, *upper* embracing and often exceeding the spikelet, 1-nerved, lightly bicarinate towards the tip; *valve* resembling the upper glume and usually shorter: *pale* equalling the valve truncate or emarginate at the tip; *stamens* 3, anthers 1 mm. long; *fruit* not seen.

Cape Province.—Basutoland: Leribe, *Dieterlen* 6328 (*Herb. Mus. Austr. Afr.*). Vitenhage, stony spots on the Van Stadens River Mountains, *Ecklon* and *Zeyher* 289 (*Herb. Mus. Austr. Afr.* 12698).

Natal.—Summit of Majuba, *Burtt-Davy* 7746 (*Nat. Herb. Pret.*); Strydhoek, Mount Tintwe, *Doidge* (*Nat. Herb. Pret.* H. 19813).

Very near *S. centrifugus*, from which it differs mainly in the firm, shining basal sheaths, longer and more constantly filiform leaves, and usually narrower panicle.

Plate IV.
Sporobolus artus Stent.

Plate V.
Sporobolus filifolius Stent.

The comparative size of the lower glume differs on the same plant. *Dieterlen* 671 shows a form with rather long spikelets (4 mm.), but otherwise agrees with the two other specimens.

17. **S. Tysonii**, Stent, n. sp. [Plate VI.]

Perennial, densely tufted, on oblique rhizome. *Culms* slender, up to 30 cm. high, 1–2-noded, smooth and glabrous, erect or subgeniculate, simple; *basal sheaths* up to 5 cm. long, closely imbricate and persistent, firm, smooth, somewhat shining, brownish-yellow, sometimes flushed with red, glabrous except at the often ciliate margins, finely, often very faintly striate; *ligule* a minutely ciliolate rim; *blades* narrow linear, flat, tapering to a setaceously convolute apex, 2–4 mm. wide and up to 11 cm. long, smooth, finely ribbed, glabrous except for the usually ciliate margins, cilia tubercle based, rather fine and rigid and about 1·5 m. long. *Panicle* narrow ovate, up to 7·5 cm. long, 2 cm. broad, branches verticillate, obliquely ascending, lowest up to 3 cm. long, undivided in the lower half, branchlets and pedicels short, more or less appressed. *Spikelets* about 4 mm. long, yellowish-brown; *glumes* unequal, *lower* equalling about three-quarters of the spikelet, narrow acuminate, 1-nerved, minutely scaberulous on the keel, *upper* broader, equalling the spikelet, 1-3-nerved, bicarinate towards the tip; *valve* resembling the lower glume; *pale* equalling the valve; *stamens* 3, anthers 2 mm. long; *fruit* not seen.

Cape Province.—Griqualand East: On grassy slopes near Kokstad, *Tyson* 1473 (*Herb. Mus. Aust. Afr.*). Cathcart, *Sim* 2728 (*Herb. Bolus*).

Very near to *S. centrifugus* than which the panicle is rather more contracted, the basal sheaths broader and more firmly coriaceous, and the blades more constantly flat, broader and longer.

18. **S. laxivaginatus**, Stent. n. sp. [Plate VII.]

Perennial, densely tufted on a creeping rhizome. *Culms* up to 1 m. high, smooth or minutely scaberulous, 2–3-noded, simple or branched from the lower nodes; *sheaths of the leaves* loose and rather broad, the basal ones straw-coloured, becoming hard, smooth and shining, glabrous, those of the culm broader, striate hirsute or glabrescent usually equalling or exceeding the internodes; *ligule* a narrow ciliolate rim: *blades* hirsute or glabrescent, scaberulous on both sides, up to 24 cm. long, those of the barren shoots very narrow and involute, those of the culms up to 10 mm. wide, minutely spinulose, ciliate on the margins. *Panicle* ovate-acuminate, up to 18 cm. long × 5 cm. wide: *branches* smooth, verticillate, obliquely ascending, undivided for from half to three-quarters of their length, branchlets and pedicels short, appressed, subsecund. *Spikelets* dark brownish-green, crowded towards the ends of the branches, 4 mm. long; *glumes* somewhat unequal, *lower* equalling three-quarters or more of the spikelet, narrow ovate-acuminate, slightly falcate, acute, 1-nerved, minutely scaberulous, *upper* broader, embracing and usually slightly exceeding the spikelet, 1-nerved, 2-keeled towards the subacute tip; *valve* 1-nerved, obtuse or subacute; *palea* equalling the valve, truncate or rounded; *anthers* 3, 1·75–2 mm. long; *fruit* ovate-obtuse, subcompressed towards the apex, 2 mm. long, pericarp rather thick, soon splitting and ejecting the seed.

Natal: Umpumulu, on bare hills, *Buchanan* 297 (*Natal Herb.*); Van Reenen, *Wood* 7218 (*Natal Herb.* 7960); Cedara, *Fisher* 44 (*Natal Herb.* 12456); Dargle, *Laudt* (*Natal Herb.* 8584).

Cape Province: Griqualand East: Nolangeni, *Tyson* 1327 (*Herb. Mus. Austr. Afr.* 6006); Bazeia, *Baur* 555 (*Herb. Alb. Mus.*).

Transvaal: Carolina Dist.: Between Machadadorp and Carolina, *Mundy* (*Nat. Herb. Pret.* H. 4286). Ermelo Dist.: Spion Kop, *Burtt-Davy* (*Nat. Herb. Pret.* H. 9236). Tzaneen Dist.: New Agatha, *McCallum* (*Nat. Herb. Pret.* H. 21682). Pretoria Dist.: Pretoria, on the Natal Road, *Pole Evans* 286 (*Nat. Herb. Pret.*)

Buchanan 297 from Natal and *Baur* 555 have been distributed as *S. centrifugus*, and are quoted under that species by Stapf (Dyer Flor. Cap. VII. 584). *S. laxevaginatus*

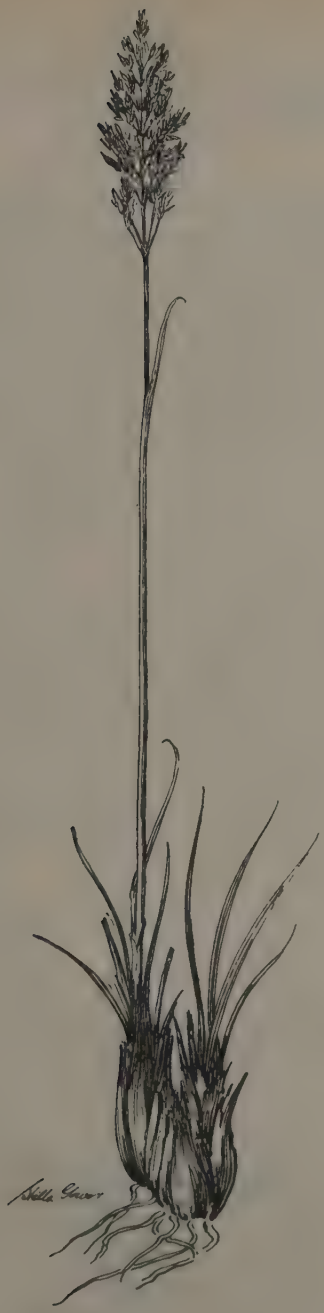

Plate VI.
Sporobolus Tyxonii Stent.

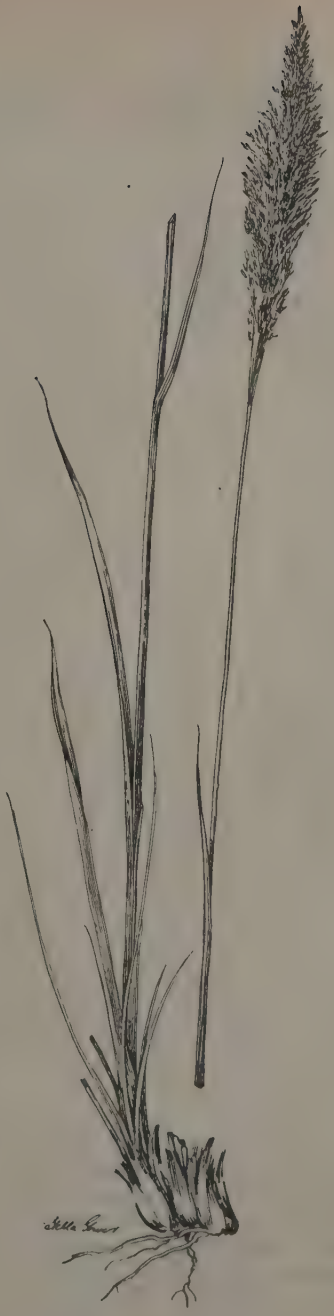

Plate VII.
Sporobolus laxeraginatus Stent.
(The panicle is typically not as congested as shown in this figure, and the whorling of the branches more obvious.)

is a much coarser species than *S. centrifugus* with larger panicle, darker and more crowded spikelets, broader and looser sheaths, of which the basal ones are firmer and of a polished smoothness, while those of *S. centrifugus* are thinner and striate.

19. **S. stuppeus,** Stent. n. sp. [Plate VIII.]

Tufted perennial. *Culms* slender, erect or subgeniculate, glabrous, smooth, 11–30 cm. long, 2–3-noded ; *basal sheaths* short, 1–3 cm. long, narrow, base and margins covered with tawny fugacious thin-walled curled hairs, soon splitting up into fibres that persist and form a dense matted tuft round the base of the culms ; upper sheaths tight, terete, glabrous, except for a few of the same kind of hairs at the mouth, scaberulous on the outside or smooth; *ligule* a ciliate rim ; *blades* very narrow, linear, tapering to a filiform point, usually, setaceously convolute, 4–6 cm. long × 1·5 mm. wide when expanded, glabrous, scabrid on the margins. *Panicle* ovate, lax, 3–7 cm. long × 2·5–5 cm. broad ; rachis straight or subflexuous, smooth, glabrous ; *branches* solitary, rarely binate, divided from or near the, base, branchlets spreading ascending ; pedicels up to 3 mm. long, branches, branchlets and pedicels delicately filiform, smooth. *Spikelets* 1·75 mm. long, oval-acute ; *glumes* hyaline, acute, or acuminate, denticulate, lower 0·8 mm. long, nerveless ; upper 1·3 mm., 1–nerved ; *valve* 1-nerved, acute or obtuse, sometimes minutely denticulate at the tip ; *pale* equalling the valve, truncate when expanded ; *stamens* 3, anthers 0·75 mm. long ; *Fruit* ovate, 0·5 mm. long ; pericarp swelling.

Transvaal.—Witwatersrand : Johannesburg, *Burtt-Davy* 7496 (*Nat. Herb. Pret.*). Pretoria Dist. : Irene, *Burtt-Davy* 14656 ; *Pole Evans* 220 (*Nat. Herb. Pret.*) ; Claremont, near Pretoria, *Kresfelder* (*Nat. Herb. Pret.* H. 20834) ; Pretoria, *Leendertz* 6286 (*Herb. Trans. Mus.*) ; Magaliesberg near the Wonderboom, *Burtt-Davy* 2683 (*Nat. Herb. Pret.*) ; Magaliesberg, *Schlechter* 3595 (*Herb. Alb. Mus.*) ; 6364 (*Herb. Trans. Mus.*) ; Wonderboom, *Burtt-Davy* 7184, 3343 ; *Pole Evans* 229 (*Nat. Herb. Pret.*) ; Kaalplaats, *Mogg* 340 (*Nat. Herb. Pret.*) ; Rietfontein, *Pole Evans* (*Nat. Herb. Pret.* 18907). Rustenburg Dist. : Rooikop, Bushveld, *Pole Evans* 256 (*Nat. Herb. Pret.*), *Pegler* 1095 (*Herb. Bolus*) ; Pillansberg, *Smuts* and *Pole Evans* 632 ; Crocodile River, *Schlechter* 3900 (*Herb. Mus. Austr. Afr., Herb. Alb. Mus.*) ; Maricana River, *Burtt-Davy* 161 (*Nat. Herb. Pret.*). Waterberg Dist. : near Nylstroom, *Burtt-Davy* 2068 and 2023 (*Nat. Herb. Pret.*) ; Klipfontein, Springbok Flats, *Nelson* 274 (*Herb. Trans. Mus.*).

Swaziland.—Black M'belusi, *Burtt-Davy* 10650 (*Nat. Herb. Pret.*).

Natal.—Dundee, *Green* 81 (*Natal Herb.* 9230) ; Camperdown, *Franks* (*Natal Herb.* 12613) ; near Maritzburg, *St. George* 25 (*Natal Herb.* 8106) ; Howick, *Franks* (*Natal Herb.* 14549) ; Umsinga, *Buchanan* 96 (*Herb. Bolus*).

This is *S. festivus* var. *steppeus*, Stapf (Dyer. Flor. Cap. VII, 582) ; though bearing a certain resemblance and affinity to *S. festivus* Hochst., yet it differs in such important characters as the size of the spikelet and the glumes, the shape of the panicle, and the character of the basal sheaths, and I agree with Hackel in considering that it should be given specific rank.

20. **S. festivus,** Hochst. var. **fibrosus** Stapf. [Cheval. Sudan, 142, 155 (1911)].

Tufted perennial. *Culms* slender, straight or sub-geniculate, 2–3-noded, glabrous, finely sulcate, smooth or minutely scaberulous ; *basal sheaths* thin, loose, soon drying and splitting into fibres, culm sheaths tight, glabrous, or with ciliate margins : *ligule* a fringe of hairs ; *blades* linear, narrowing to a subacute tip, 2–4 mm. broad × 2–6 cm. long, flat or involute in the upper part, glabrous, finely nerved, smooth above, minutely scaberulous on the nerves below. *Panicle* ovate, erect, often with the base enclosed in the upper sheaths, up to 15 cm. long × 5 cm. wide ; rachis smooth, glabrous, finely sulcate ; branches solitary, scattered, divided from the base ; branches, branchlets, and pedicels finely filiform and usually flexuous, pedicels 1·5 3 mm. long. *Spikelets* 1–1·3 mm. long, oval-acute, purplish ; *glumes* sub-equal, very small, hyaline ; *lower* 0·3 mm., broadly obtuse or shortly

Plate VIII.
Sporobolus stupeus Stent.

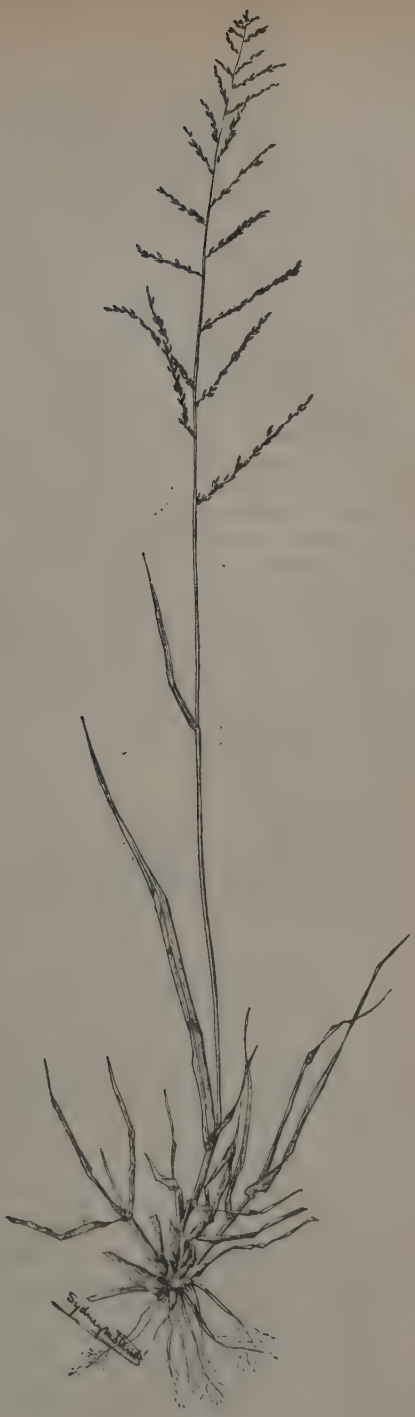

Plate IX.
Sporobolus Fourcadii Stent.

acuminate, entire or obscurely toothed or fimbriate ; *upper* 0·5 mm. broadly ovate, abruptly acuminate, 1-nerved ; *valve* ovate-acute, 1-nerved, flushed with purple, 1·3 mm. long ; *pale* equalling the valve ; *stamens* 3 ; anthers 0·5 mm. ; *fruit* ovate, 0·6 mm. long, pericarp swelling in water testa not mucilaginous.

Transvaal.—Zoutpansberg Dist. : Houtbosch, *Schlechter* 4403 (*Herb. Alb. Mus.*) ; Woodbush, *Schlechter* 6354 (*Herb. Trans. Mus.*). Waterberg Dist. : Pienaars River, *Schlechter* 4207 (*Alb. Mus. Herb., Nat. Herb. Pret., Herb. Trans. Mus.*) ; Warmbaths, *Stent* (*Nat. Herb. Pret.* H. 21536) ; Springbok Flats, *Burtt-Davy* 1111 (*Nat. Herb. Pret.*) ; Pietpotgietersrust, *Leendertz* 6590 (*Herb. Trans. Mus.*), *Galpin* 8907 (*Nat. Herb. Pret.*). Witwatersrand Dist. : Johannesburg, *Edwards* 274 (*Herb. Alb. Mus.* and *Herb. Bolus*).

Also in Trop. Africa ; very near to *Sporobolus stuppeus*, from which it differs in the absence of the dense matted tuft of fibres at the base, longer panicle, smaller spikelets, etc.

21. **S. micranthus,** Conrath and Hack (in Oost. Bot. Zeitschr. 1903, 198).

Tufted perennial. *Culms* slender, erect, up to 49 cm. long, terete, glabrous, 3-noded, simple ; *basal sheaths* short, persistent, splitting into fibres ; upper sheaths tight, narrow, glabrous, or with a few scattered hairs, bearded at the mouth ; *ligule* a ciliate rim ; *blades* very narrow, linear, about 1 mm. broad × 12 cm. long, flat or setaceously convolute, with a stout thickened rib close to each margin, scaberulous. *Panicle* ovate, open, lax, with fine white hairs in the axils of the branches, 8–15 cm. long by 4–10 cm. broad, rachis and branches smooth, subflexuous ; *branches* solitary, rarely binate, spreading at right angles or more or less obliquely ascending, divided from the base, filiform ; branchlets and pedicels finely capillary, patent, the latter 2–4 mm. long. *Spikelets* scattered, 1·6 mm. long, lanceolate, dark greyish-green ; *glumes* subequal, broadly ovate, obtuse or subacute, equalling about one-third of the spikelet, nerveless ; *valve* ovate-lanceolate, subacute, or acute, 3-nerved, side nerves sometimes obscure ; *pale* very like the valve, 2-nerved, flat on the back or sub-canaliculate ; *stamens* 3, anthers 1·3 mm. long ; *fruit* narrow oval, pericarp swelling slightly in water.

Orange Free State.—Heilbron Dist. : Maccauvlei, *Brandmuller* 36 (*Nat. Herb. Pret.*).

Transvaal.—Rustenburg, Kopjes near the Crocodile River, *Schlechter* 3977 (*Herb. Alb. Mus.* and in *Herb. Bolus*). Pretoria Dist. : Rooikop, *Pole Evans* 535 (*Nat. Herb. Pret.*).

In appearance resembling very closely *S. subtilis*, but with a narrower panicle, more rigid leaves, and fibrous base, and without the characteristic produced rachilla of *S. subtilis*.

22. **S. acinifolius,** Stapf (in Dyer. Flor. Cap. VII, 581).

Perennial, caespitose ; rhizome slender, branched, with numerous short barren shoots. *Culms* erect, slender, 23–35 cm. long, glabrous, smooth, 2–3-noded. Leaves of the innovation shoots and those at the base of the culms densely crowded, distichous ; *lower sheaths* short, membranous, striate, culm sheaths rather shorter than the internodes, tight, striate, firm, with thin white membranous margins, glabrous ; *ligule* a densely ciliate rim ; *blades* cuneate, subulate, flat, or involute towards the acute callous tip, 2·5 cm. long, 3 mm. wide at the base, glaucous, very rigid, with thick white cartilaginous margins, upper surface densely white papillose. *Panicle* erect-ovate to ovate-oblong, very lax, divaricate ; *branches* solitary, filiform to capillary, dichotomously branched, smooth ; pedicels 2–3 mm. *Spikelets* oblong, light purplish, 1·6 mm. long ; *glumes* unequal, hyaline, nerveless, obtuse, the *lower* 1 mm. long, the *upper* 1·5 mm. long ; *valve* oblong, obtuse, delicate, hyaline above, firmer below, concave, 3-nerved, nerves evanescent towards the tip ; *pale* slightly shorter ; *stamens* 3 ; anthers purplish, 1–1·5 mm. long ; *fruit* 1 mm. long, obliquely obovate, compressed ; pericarp swelling in water and distinctly mucilaginous.

Cape Province.—Kuruman, *Mogg* 7635 (*Herb. Vet. Res. Pret.*) ; Armoedsvalkte, Vryburg, *Foley* (*Nat. Herb. Pret.* 2824).

Stapf founded this species on *Burchell's* 1846 from Griqua Town, collected about 1813 ; this remained the only record of the plant till 1920, when it was collected by J. W. Mogg at Kuruman and later at Vryburg by M. Foley.

23. **S. robustus,** Kunth. (Rev. Gram., 11, 425, t. 126).

Perennial, tufted, or stoloniferous (?). *Culms* robust, geniculate, ascending, up to 6-noded and branched from most of the nodes, 0·7–1·3 m. long; *basal sheaths* short, ovate, acute, straw-coloured, smooth, shining and scale-like, without or with very much reduced blades; upper sheaths firm, loose, glabrous, finely striate, exceeding the internodes; *ligule* a rim of very short rigid hairs; *blades* linear, long, tapering to an apex, flat or folded, 4–6 mm. wide; up to 26 cm. long, not contracted at the base, glabrous, rigid, striate, scaberulous on the margins only, or all over, midrib white and conspicuous above, scarcely prominent beneath. *Panicle* long, narrow, elliptic, 23–42 cm. long × 1·5–5·5 cm. wide, rachis sulcate, smooth; *branches* solitary, rarely the lower subverticillate, obliquely ascending up to 11 cm. long, divided from near the base; branchlets and lateral pedicels short, appressed. *Spikelets* pale-greyish or glaucous-green, 2·5 mm. long; *glumes* equal, or subequal, the length of the spikelet, the lower sometimes slightly exceeding it, ovate, acute, 1-nerved, upper part of keel scabrid; *valve* like the glumes, but not scabrid; *pale* ovate, with rounded tip (when expanded), 2-nerved, canaliculate down the centre; *stamens* 3; anthers 1–1·5 mm. long.

Transvaal.—Zoutpansberg: Messina, *Pole Evans* (in *Nat. Herb. Pret.* H. 13113.)

A coarse much-branched tropical grass, with erect narrow panicle.

24. **S virginicus,** Kunth (Rev. Gram., 1: 67, 1829).

Perennial, rhizome, long creeping, stoloniferous, sending up flowering shoots from the nodes. *Culms* up to 38 cm. long, many-noded, sheathed to the base of the inflorescence; *sheaths* tight, glabrous, sulcate, overlapping each other, having at the mouth and sometimes on the thin margins; *ligule* a ciliate rim: *blades* up to 10 cm. long, 2–6 mm. broad, convolute towards the narrow acute tip, often pungent, firm, usually more or less flat at the base or sometimes in the broader-leaved forms flat right through, glabrous, scaberulous on the upper surface, smooth below, many and firmly nerved, margins scabrid. *Panicle* contracted and spike-like, rarely somewhat loosened, 2–9 cm. long; *branches* short, divided from or very near to the base; pedicels short. *Spikelets* greyish-green, 2–3 mm. long; *glumes* unequal, ovate acute, 1-nerved, keels acute, scaberulous above, the *lower* equalling half to four-fifths of the upper; the *upper* as long as or usually rather longer than the valve; *valve* like the upper glume, 1-nerved; *pale* truncate or obtuse, canaliculate down the centre; *stamens* 3; anthers 1·5 mm. long; *fruit* narrow ovate, slightly compressed, yellow, with delicate reddish veinings; pericarp swelling.

Cape Division.—Cape Peninsula: Buffels Bay, *Edwards* (*Nat. Herb. Pret.*); Flats below Wynberg, *Bolus* 15062 (in *Alb. Mus. Herb.* and *Nat. Herb. Pret.*); Miller Point, *Wolley Dod* 2288 (*Herb. Bolus*); Muizenberg Vlei, *Wolley Dod* 925 (*Herb. Bolus*); Cape Flats, *Rehmann* 1767 (*Alb. Mus. Herb.*); Green Point, *Ecklon* (*Herb. Mus. Austr. Afr.*). East London: East London, near Cove Rock, *Galpin* 7356 (*Nat. Herb. Pret., Alb. Mus. Herb.*); West of East London, *Hilner* 377 (*Alb. Mus. Herb.*). Uitenhage: North of Van Staden River, *MacOwan* 710 (*Herb. Mus. Austr. Afr., Herb. Bolus*); Redhouse, *Paterson* 498 (*Natal Herb.* 15865, *Herb. Bolus*); Uitenhage, *Ecklon and Zeyher.* (*Herb. Mus. Aust. Afr.*).

Port Elizabeth Div.—*Drège* 649 (*Alb. Mus. Herb.*); Zwartkops River, *Ecklon* (*Alb. Mus.* and *Herb. Mus. Aust. Afr.*).

Bathurst Div.—Pora River mouth near Mazeppa Bay, *Hilner* 507 (*Alb. Mus. Herb.* and *Nat. Herb. Pret.*); Marsh ground, Grahamstown, *Salisbury* (*Alb. Mus. Herb.*); near Port Alfred, *Burchell* 4032 (*Herb. Mus. Austr. Afr.*); sand-dunes, Port Alfred, *Tyson* (*Nat. Herb. Pret.* 12610, *Natal Herb.* 15859, *Herb. Bolus* 14882); lagoon, Port Alfred, *Galpin* 2971 (*Nat. Herb. Pret.* and *Alb. Mus. Herb.*); *Potts* 186 (*Alb. Mus. Herb.*); *Britten* 796, 1930 (*Alb. Mus. Herb.*); *Flanagan* 1892; 997 (*Nat. Herb. Pret., Herb. Bolus, Grey College Herb.* 4268 (*Herb. Trans. Mus.*). Natal: Verulam, *Wood* 10223 (*Natal Herb.* 11352; *Herb. Bolus*); Conzella, *Wood* 11980 (*Natal Herb.* and *Herb. Mus. Austr. Afric.*); Bluff, Durban, *Wood* 12548 (*Natal Herb.* 14474).

The Natal plants have slightly shorter spikelets and broader and flatter leaves.

The only one of the specimens I have examined which is in fruit is Tyson's from Port Alfred, and I have described the caryopsis from that plant.

25. **S. fimbriatus,** Nees. (Fl. Afr. Aust., 156).

Perennial, densely tufted. *Culms* erect or geniculate, 2–3 ft. long, 2–4-noded, simple or branched from the lower nodes; *sheaths* glabrous, rarely with a few scattered spreading hairs, often ciliate along the margins, smooth, the lowest pallid and more or less compressed and keeled; *ligule* a ciliate rim; *blades* linear, tapering to a long setaceous point, 12–25 cm. × 2–4 mm., flat or more usually involute, with inrolled margins, glabrous or rarely the lower ones with scattered spreading hairs; primary lateral veins conspicuous, usually three on either side the inconspicuous midrib. *Panicle* erect, long and often more or less contracted, tapering to a narrow apex, 19–35 cm. long, and 3–7 cm. broad; *branches* solitary, irregularly crowded, 2–7 cm. long, filiform ascending, spreading, branched from the base, or occasionally the base bare for 1 cm.; branchlets usually very short, but in some specimens attaining a length of 2½ cm.; pedicels short. *Spikelets* greyish-green to dark olive-grey, up to 2 mm. long, usually crowded on the branchlets, more rarely somewhat lax; *glumes* unequal, the lower equalling about half the spikelet, narrow, nerveless, acute, or subacute; *upper* nearly equalling the spikelet or sometimes slightly exceeding it, acute or subacute, 1-nerved, more or less scaberulous on the back; *valve* ovate, acute, 1-nerved; *pale* canaliculate from the tip down, rather broadly rounded, or emarginate at the tip when expanded; *stamens* 3; anthers 1 mm. long; *grain* slightly compressed, quadrangular, up to 1 mm. long; pericarp delicate and swelling in water.

Cape Province.—Humansdorp Division: Humansdorp, below Zuurbron, *Fourcade* 2568 (*Nat. Herb. Pret.*). Albany Division: Carlisle Bridge, *Bowker* 1 (*Herb. Alb. Mus.*); Brakkloof, Grahamstown, *Hutton* 6 (*Herb. Alb. Mus.*); Graaff-Reinet, on stony hill, *Bolus* 555 (*Herb. Alb. Mus.*); Caledon, Sir Lowry's Pass, *Schlechter* 1169 (*Herb. Alb. Mus.*). Vryburg District: Warrenton, *Adams* 183 (*Herb. Alb. Mus.*); Kimberley, *Moran* (*Herb. Mus. Austr. Afr.*, *Herb. Bolus* 12730, *Nat. Herb. Pret.* H. 13912); western slopes of Langeberg range, *Pole Evans* 91 (*Nat. Herb. Pret.*); Riverton, *Wilman* (*Herb. Trans. Mus.* 19618), *Potgieter* (*Herb. Bolus* 1510); Armoedsvlakte, near Vryburg, *Theiler* (*Nat. Herb. Pret.* H 30163, H. 20163, H. 20203, H. 20200, H. 20178, H. 20205, H. 20180, H. 21617). Basutoland: Leribie, *Dieterlen* 84 (*Herb. Mus. Austr. Afr.* 9468).

Orange Free State.—Heilbron Dist.: Maccauvlei, *Brandmuller* 25 (*Nat. Herb. Pret.*); Bloemfontein, *Rehmann* 3799 (*Herb. Alb. Mus.*), *Potts* 1257 (*Herb. Bolus*). Boshoff Dist.: Smits Kraal, *Burtt-Davy* 11344, 10101, 11349 (*Nat. Herb. Pret.*).

Transvaal.—Bloemhof Dist.: Fourteen Streams, *Burtt-Davy* 1691, 1635 (*Nat. Herb. Pret.*); Christiana, on farm Kaffraria, *Burtt-Davy* 13090, 12758, 12765, 13054, 14160 (*Nat. Herb. Pret.*). Potchefstroom Dist.: near Machavie Station, *Burtt-Davy* 1476 (*Nat. Herb. Pret.*). Pretoria Dist.: Derdepoort, *Fouche* (*Nat. Herb. Pret.* H. 21618); Rooikop, Bushveld, *Pole Evans* 157 (*Nat. Herb. Pret.*). Ermelo Dist.: Davel, *Burtt-Davy* 1656 (*Natal Herb.*). Lydenburg Dist.: near Lydenburg, *Atherston* (*Herb. Alb. Mus.*); Roggerveld, *Rehmann* 3207 (*Herb. Alb. Mus.*).

Var. **latifolia,** Stent (Bothalia, I, 4, 279).

Leaves up to 12 mm. broad; culms robust, up to 1·8 m. long [=*S. Rehmanni Hack* (in part)].

Transvaal.—Pretoria Dist.: Haamans Kraal, *Burtt-Davy* 1086 (*Nat. Herb. Pret.*); Groenkloof, Pretoria, *Pole Evans* 395 (*Nat. Herb. Pret.*); near Irene, *Pole Evans* 131 (*Nat. Herb. Pret.*). Boschveld: farm Klippan, *Rehmann* 5373 (*Herb. Alb. Mus.*). Waterberg Dist.: Mosdene, Naboomspruit, *Galpin* M. 460 (*Nat. Herb. Pret.* H. 20197), *Galpin* M. 461 (*Nat. Herb. Pret.*).

Natal.—Without precise locality, *Gerrard* and *McKen* 44 (*Natal Herb.*); Clairmont, *Wood* 6055 (*Natal Herb*); Camperdown, *Franks* (*Natal Herb.* 11709, *Herb. Alb. Mus.*, *Nat. Herb. Pret.*); Durban, *Rehmann*, 8626 (*Herb. Alb. Mus.*); Tugela River, *Buchanan* 245 (*Natal Herb.*).

The type occurs freely in the dry and sandy regions of the grass and thorn veld. It is plentiful in association with *Eragrostis* spp. in parts of Bechuanaland and the High Veld.

The variety is a Bushveld form that also occurs in Natal and probably extends north into the tropical regions.

Rehmann's 5373, on which Hackel founded his species *S. Rehmann*, has hairy leaves and a narrow panicle. I have seen no other specimen quite like it.

Stapf (in Dyer Flor. Cap. VII, 585) has kept *S. Rehmanni* as a distinct species, and has amplified Hackel's description to include all the glabrous broad-leaved forms of the Bushveld and Natal. Critical examination of a number of specimens ranging from *S. fimbriatus*, sensu stricto, though all variations of width of leaf and panicle to the broad-leafed and robust form of the Bushveld and Natal has convinced me that this latter is only a climatic and edaphic variety of *S. fimbriatus*.

26. **S. Fourcadii,** Stent, n. sp. [Plate IX].

Tufted perennial, on a short creeping rhizome. *Culm*, erect or subgeniculate, 14-40 cm. high, 1-noded, terete, glabrous, smooth; *sheaths* rather tight, compressed, firm, striate; *ligule* reduced to a narrow ciliate rim; *blades* narrow, tapering to a fine acute point, flat or involute, about 4 mm. wide × 8-10 cm. long, primary lateral nerves about 3 on either side the midrib, rigid, prominent below, scarcely distinguishable on the upper surface from the fine close secondary nerves, glabrous, smooth, margins scaberulous. *Panicle* narrow, linear lanceolate, scanty; *branches* not crowded mostly solitary, flexuose, short, longest up to 4 cm. long, spreading at right angles or obliquely ascending, scabrid, divided from near the base; *branchlets* short, scabrid 2–4 spiculate, appressed to the branches. *Spikelets* subsessile or on very short pedicels, 2 mm. long, lanceolate acuminate, rather pale, greyish-green or almost straw-coloured; *glumes* unequal, *lower* quarter to one-third the length of the spikelet, nerveless, obtuse or truncate, minutely dentate; *upper* equalling about two-thirds the spikelet, lanceolate, acute, or sub-acute, minutely dentate, 1-nerved; *valve* sub 3-nerved, the sides inflexed towards the tip, tip minutely dentate; *pale* shorter than the valve, obtuse to subtruncate, nerveless, canaliculate; *stamens* 3 (occasionally 2); anthers 0·8 mm.; *fruit* oblong, 1 mm. long; pericarp swelling slightly in water.

Cape Province.—Knysna, *Burtt-Davy* 15116 (*Herb. Bolus*). Humansdorp Div.: Humansdorp, *Fourcade* 1986 (*Nat. Herb. Pret.*, *Herb. Bolus*); George, *Schlechter* 2224 (*Herb. Alb. Mus.* and *Herb. Bolus*). Bathurst Div.: Kowie, *Hutton* 45 (*Herb. Alb. Mus.*).

Distributed as *S. diandra*, Beauv., an Indian species to which the South African plant bears a certain superficial resemblance, but from which it differs in the size of the glumes, the width of the leaves, the arrangement of the branches of the panicle and other points.

27. **S. pyramidalis,** Beauv. (Flor. d'Oware et de Benin, 11, 36).

Perennial, tufted. *Culms* up to 1·5 m. long and to 4-noded (usually 2·3), erect, glabrous, smooth, terete or sub-compressed at the base, sheathed all along or the upper internodes exserted; *sheaths* quite glabrous, sometimes shortly ciliate on the margins, smooth, finely striate, upper terete, lower more or less compressed, pallid; *blades* linear, tapering to a fine point, 3-8 mm. wide, 10-30 cm. long, flat or folded, minutely scaberulous, midrib slender but prominent, primary lateral nerves 4 on either side, glaucous. *Panicle* erect, narrow, lax, 18-44 cm. long, 2-5 cm. broad, tapering to the tip; rachis smooth, terete, finely sulcate; *branches* simple or divided with short branchlet often secund, scattered or occasionally verticillate, bearing spikelets from the base or bare for from 10-20 mm. above the base. *Spikelets* crowded, dark greyish-green, 1·7-2 mm. long; *glumes* unequal; *lower* up to 0·5 mm., broadly rounded or truncate, often denticulate, nerveless; *upper* up to 0·9 mm., subtruncate, or broadly rounded or sometimes shortly and abruptly obtusely

acuminate, 1-nerved, both thinly membranous; *valve* obtuse to subacute, scaberulous, equalling or slightly shorter than the pale, 1–3 nerved; *pale* usually slightly longer than the valve, with broadly rounded tip when flattened out; *stamens* 3; *lodicules* small, broadly truncate or emarginate; *fruit* quadrangular, ovate, remaining for some time after ripening, attached to the base of the floret; pericarp tardily swelling and bursting in water.

Natal.—Without precise locality, *Buchanan* 243, *Gerrard* and *McKen* 45 (*Natal Herb.*); Tembuland, *Baur* 405 (*Herb. Mus. Austr. Afr.* 12654); Hilton Road, *Schlechter* 6769 (*Herb. Alb. Mus.*); Berea, Durban, *Wood* 5924 (*Natal Herb.*); Umtwynkwa Cutting, Isolo, *Galpin* 6922 (*Herb. Alb. Mus.* and *Nat. Herb. Pret.*); Farkkop, *Rehmann* 7675 (*Herb. Alb. Mus.*); Maritzburg, *Angus* (*Nat. Herb. Pret.* H. 13799), *St. George* (*Nat. Herb. Pret.*), *Wood* 7243 (*Herb. Bolus*); Zululand, *Jenkinson* 6 (*Natal Herb.* 7961); South Coast, Natal, *Pole Evans* 782 (*Nat. Herb. Pret.*); Bremersdorp, *Burtt-Davy* 3013 (*Nat. Herb. Pret.*).

Transvaal.—Carolina Dist.: near Bossies, *Burtt-Davy* 2955 (*Nat. Herb. Pret.*). Witwatersrand: Johannesburg, *Bryant* B 23 (*Nat. Herb. Pret.*). Lydenburg Dist.: Sterk Hill, *Burtt-Davy* 478 (*Nat. Herb. Pret.*). Pretoria, *Leendertz* 12790 (*Herb. Trans. Mus.*); Wolvenkraal, Kameel River, *Pole Evans* (*Nat. Herb. Pret*). Waterberg Dist.: Pietpotgietersrust, *Galpin* 8898 (*Nat. Herb. Pret.*); Warmbaths, *Leendertz* 6664 (*Herb. Trans. Mus.*); Springbok Flats, *Burtt-Davy* 1137 (*Nat. Herb. Pret.*). Zoutpansberg: Spelonken, *Junod* 115 (*Herb. Trans. Mus.* 20257). Pretoria: Irene, *Pole Evans* 376 (*Nat. Herb. Pret.*).

28. **S. indicus,** R. Br. (Prod. 170).

Perennial, tufted. *Culms* erect or geniculate, 1–3 ft. long, glabrous, smooth, 1–3-noded (usually 2-noded), below the panicle, terete or sub-compressed, sheathed all along or the upper internodes exserted; *leaves* mostly crowded near the base; *sheaths* glabrous, except on the often ciliate margins, finely striate, the lower ones sub-compressed; *pale* 1–2 ins. long and rather broad and membranous; *ligule* a minutely ciliate rim; *blades* linear, tapering to a fine point, 2–4 mm. wide and up to 20 cm. long, glabrous, smooth above and usually finely scaberulous below and on the margins, flat or convolute. *Panicle* narrow, spike-like above; *branches* and branchlets solitary, very short, crowded, and many spiculate, except the lower ones, which are often up to 2·5 cm. long and more distant and appressed. *Spikelets* dark greyish-green over 2 mm. and under 3 mm. long; *glumes* unequal; lower oblong, obtuse, nerveless, 0·8–1 mm. long, thinly membranous; *upper* ovate-acuminate, acute or subacute, 1-nerved, 1–1·6 m. long, thinly membranous; *valve* 2·5 mm., 1–3-nerved, minutely scaberulous, obtuse or minutely truncate, margins reflexed towards the tip; *pale* equalling the valve, rounded or subtruncate; *stamens* 3; anthers 1 mm. long; *lodicules* 0·3 m. long, delicate, broadly truncate or emarginate; *fruit* quadrangular, oblong, pericarp swelling in water, very delicate.

Cape Province.—Knysna: in forest, *Bolus* 2694 (*Herb. Bolus*). Humansdorp: Hofmansbosch, *Britten* 1217 (*Herb. Alb. Mus.*); Flats Witte Els Bosch, *Fourcade* 996 (*Herb. Alb. Mus.*); George, near Montagu, *Kensit* (*Herb. Bolus* 14730); Montagu Pass, *Burtt-Davy* 12595 (*Nat. Herb. Pret.*). East London: Slopes near Kefani River Mouth, *Galpin* 5823 (*Nat. Herb. Pret.*, *Herb. Alb. Mus.*). Albany: Oatlands Park, Grahamstown, *Daly* and *Sole* 156 (*Herb. Alb. Mus.*). Bathurst: Kowie, *Hutton* 15*a* (*Herb. Alb. Mus.*); Port Alfred, *Burtt-Davy* 7888 (*Nat. Herb. Pret.*), *Tyson* (*Nat. Pret.* H. 12558, *Herb. Trans. Mus.* 17076, *Herb. Bolus* 14885). Komgha: near Komgha, *Flanagan* 1257 (*Herb. Mus. Austr. Afr.*, *Herb. Alb. Mus.* 1910, *Herb. Bolus*). Caledon: Sir Lowry's Pass, *Schlechter* 1166 (*Herb. Alb. Mus.*; Hermanus, *Pole Evans* 445 (*Nat. Herb. Pret.*). Peninsula: Grassy veld near Capetown, *Zeyher* 48 (!) (*Herb. Mus. Austr. Afr.*); Kenilworth, *Bolus* 15049 (*Nat. Herb. Pret.*); Rondebosch, *Wolly Dod* 5344 (*Herb. Bolus*); slopes of Lion's Head, *Zeyher* 4497 (*Herb. Alb. Mus.* and *Herb. Mus. Austr. Afr.*); Noord Hoek, *Smuts.* Uitenhage: Zuurberg, *Holland* 99 (*Herb. Alb. Mus.*); near Sanatorium, *Schonland* 3194 (*Herb. Alb. Mus.*); Aloes, *Drège* (*Nat. Herb. Pret.* H. 3079).

Orange Free State.—Brandfort, *Burtt-Davy* 14703 (*Nat. Herb. Pret.*).

Cape Province.—Western Province: Without precise locality, *Kolbe* 2632 (*Herb. Trans. Mus.*). Komgha Div.: Pasture near Komgha, *Flanagan* 910 (*Nat. Herb. Pret.*). Bathurst Div.: Kowie, *Hutton* 50 (*Herb. Alb. Mus.*); Blauwkrantz River, *Schlechter* 6867 (*Herb. Alb. Mus.* and *Herb. Bolus*); Kasuga River, *MacOwan* 1015 (*Herb. Mus. Austr. Afr.*). Albany Div.: Grahamstown, *Daly* and *Sole* 171 (*Herb. Alb. Mus.*). Uitenhage Div.: Zuurberg, *Holland* 96 (*Herb. Alb. Mus.*). Alice Div.: Lovedale, *Macdonald* 10 (*Herb. Alb. Mus.*). Kentani Div.: Veld, *Pegler* 1055 (*Nat. Herb. Pret.*, *Herb. Bolus*). Middelburg: *Hewitt* (*Herb. Trans. Mus.* 12100).

There is a divergence of opinion among botanists as to the correct classification of this grass.

Grisebach (Fl. Brit. W.Ind. 533) Bentham (Fl. Austr. VII, 622), and Stapf (Dyer Fl. Cap. VII, 586) refer it to *S. indicus* R.Br., which is the *Agrostis indica* of *Linnaeus*. Hitchkock and Chase ("Grasses of the West Indies," cont. *U.S. Nat. Herb.* XVIII, 370) classify it under *Vilfa berteroana Trin* (*Sporobolus berteroana H.C.*), reserving the name *indicus* for the longer looser panicled form. Hitchkock ("Grasses of Hawaii," *Mem. Bern. Paw*, Bishop's Mus., VIII), also recognises *S. elongatus* R.Br. as a distinct species very near to *S. berteroanus*, but with a narrower laxer panicle.

The South African material corresponds on the whole rather more with Hitchkock's conception of *S. elongatus* than of *S. beteroana*, though *Bolus* 15049 from Kenilworth in the Cape Peninsula, and *Zeyher* 48 from Capetown both represent a form with the spike-like inflorescence up to 16 cm. long by 12 mm. broad. We have no record of a smut attacking this grass in South Africa.

I have for present purposes thought it advisable to adopt Stapf's classification of the grass as being the best known in this country, and as, without having access to types and with only South African material for examination, it is impossible for me to form an opinion on the subject or to throw my weight into the controversy.

28. **S. Subtilis,** Kunth (Rev. Gram. 11, t. 124).

Densely tufted perennial on a creeping rhizome. *Culms* erect, slender, glabrous, smooth, 4–5-noded, sheathed to the base of the panicle; *sheaths* very tight, narrow, glabrous, except at the usually bearded mouth; *ligule* a very short ciliate rim; *blades* very narrow, setaceously convolute, up to 23 cm. long × 1 mm. wide, minutely scaberulous, glabrous. *Panicle* oblong to almost rhomboid, lax, open, up to 15cm. long × 12 cm. broad, dichotomously branched, all divisions capillary, with fine white hairs from the axils; pedicels up to 4 mm. long. *Spikelets* few, lanceolate, 1·5–1·75 mm. long; *rhachilla* produced into a fine bristle, sometimes as long as the spikelet or much shorter; *glumes* subequal, 1-nerved acute: *lower* about 1 mm. long; *upper* slightly longer; *valve* slightly shorter than the pale, subacute, 3-nerved, side nerves obscure; *pale* narrow, obtuse, obscurely canaliculate; *stamens* 3; anthers 1 mm. long; "*grain* oblong, about 1 mm. long, subterete, finely-striate; pericarp adnate to the seed, indistinct, embryo not quite one-fifth the length of the grain." —*Stapf.*

Cape Province.—Florida, *Hutton* 614 (*Nat. Herb. Pret.* and *Herb. Alb. Mus.*).

Transvaal.—Middelburg Dist.: Belfast, *Doidge* and *Bottomley* (*Nat. Herb. Pret.* H. 21753).

Also in tropical Africa and Madagascar.

APPENDIX.

(Latin diagnoses of new species arranged alphabetically.)

S. artus, Stent, n. sp.

Gramen perenne, caespitosum, rhizoma obliquum; culmi erecti, graciles, glabri, striati, 1–2-nodi, 26–46 cm. alti; vaginae basaliae latae, imbricatae, tenue membranaceae, striatae, vaginae caulinis angustae, arctae, glabrae, leaves, tenuiter striatae; ligulae minute ciliatae; laminae anguste lineares circ. 3 mm. latae, subtus tenuiter sulcatae laeves supra laeves vel leviter scaberulae, planae vel apicem obtusum versus involutae; panicula spiciforma, ad 15 cm. longa; rami solitarii vel subverticillati, breves, arcte appressi vel inferiores paullo patentes; spiculae ad 5 mm. longae; glumae inequales; inferior spicula triplo brevior, lineare oblonga obtusa, enervata vel leviter 1-nervata; superior spiculam aequans, obtusa, leviter 1-nervata, dorso scabro; valva glumae superior similis; palea 2-nervata, expansa truncata; antherae 3, 2·3 mm. longae; lodiculae 0·5 mm. longae, latae, 3-nervis; fructus 1·5 mm. longa, ovata (immaturum tantum visum).

S. filifolius, Stent, n. sp.

Gramen perenne, dense caespitosum, rhizoma obliquum; culmi graciles, simplices, ad 40 cm. alti, vaginae basis breves, glabrae, indurescentes nitidaeque, culmorum angustae, striatae, tantum laxae; laminae angustissimae, filiforme convolutae; panicula anguste ovata, vel interdum tantum patula; rami verticillati, ramulis pedicellisque brevibus; spiculae acuminatae, 3–4 mm. longae; glumae inaequales vel subinaequales, inferior angusta, acute acuminata; superior spiculam amplectens, interdum paulo longior; valva glumae superiori similes; palea valvam aequalis, truncata vel emarginata; antherae 3.

S. Fourcadii, Stent.

Gramen perenne, caespitosum, rhizomate brevi, repente; culmi erecti vel subgeniculati, 14–40 cm. alti, 1-nodi, tereti; vaginae arctae, compressae, firmae, striatae; laminae anguste-lineares in apice acuto attenuatae, planae vel involutae, rigidae, glabrae, laeves, marginibus scabris; panicula anguste lineare-lanceolata, exigua; rami plerumque solitarii, breves, longissimus ad 4 cm. longi, horizontale-patentes vel oblique-ascendentes, scabri, prope basum divisi; ramuli brevi, scabri, appressi, parvis spiculatis; spiculae subsessiles vel brevissime pedicellatae, pallide plumbeo-virides; glumae inaequales, inferiore $\frac{1}{4}$-vel $\frac{1}{3}$ spicula aequans, enervata obtusa vel truncata, minute dentata; superiore aequans circ. $\frac{2}{3}$ spicula, lanceolata acuta vel subacuta, minute dentata, 1-nervata; valva sub 3-nervata, apice minute dentata; palea valvam breviore, obtusa, enervata, canaliculata; stamina 3 (rare 2); antherae, 0·8 mm. longae, fructus oblonga, 1 mm. longa, pericarpium in aqua parve turgiscente.

S. Gillii, Stent.

Gramen perenne, rhizome obliquum, innovationis brevis, sterilis, dense confertis; culmi geniculati plus minus compressi; foliorum vaginae compressae vel subcompressae, infimae breves, pallidae, tenuite membranaceae; laminae planae, glabrae, glaucae, in apicem minute obtusum attenuatae; panicula ovato-lanceolata, acuta, ramis verticillatis, patentis vel infimis oblique ascendentis; ramuli breves, appressi vel patenti 3-spiculati; spiculae brevissimae, plumbeo-viridae, post anthesis obtussae, hiantesque, pedicellis brevissimis vel deficientis; glumae inaequales; infra bravissima, hyalina enervata; supra valvam aequans vel paulo breviora, uni-nervata, obtusa; valva glumae superae similis, uni-nervata, late obtusa; palea lata, emarginata, in medio laxe plicate; antherae 3.

S. laxivaginatus, Stent, n. sp.

Gramen perenne, dense caespitosum, rhizomate repente ; culmi ad 1 m. alti, 2–3-nodi ; foliorum vaginae laxae, latae, basis flavae indurescentes, nitidaeque, culmorum, striatae, hirsutae vel glabrecentes ; innovationium laminae angustissimae involutae, ad 24 cm. longae, culmorum latiorae, ad 10 mm. latae, 18 cm. longae, marginibus minute spinuloso ciliatis ; panicula ovato-acuminata ad 18 cm. longa, 5 cm. lata ; ramis virticillati, obliquo-àcendentes, partis inferioribus nudis, superioribus spiciformis spiculis confertis ; spicula, atraolivaceae, 4 mm. longae ; glumae paulo inaequales, inferiore anguste ovato-acuminatae acuta, superiore lata, spiculam complectentes paulo-longiore ; valva 1-nervata, apicem versus bicarinata ; palea valvam aequans, caryopsis ovato-obtusa, apicem versus sub-compressa ; pericarpium mox findenta.

S. parvulus, Stent.

Gramen annuum ; culmi ad 6 cm. alti, ascendentes, graciles, 1-nodes ; vaginae infimae laxae, ad 5 mm. longae, tenuiter-membranaceae, sulcatae, glabrae, margines setis basi tuberculatis ciliati ; laminae ovato-lanceolatae, planae vel complicatae, ad 12 mm. longae, 2·5 mm. latae, base rontundata nonnihil amplexicaula, glabrae, tenuiter sulcatae, supra scaberulae, subtus laeves, margines cartilagines, minute spinulosi ; panicula 16–22 mm. longa, 10–16 mm. lata, rami infimi verticillati, superiores verticillati, binati, vel solitarii, demidium inferiore indivisum ; ramuli breves, appressi, plerumque bi-spiculati ; spiculae 1 mm. longae ; glumae inaequalissimae, inferior parvissima, hyalina, ovato-obtusa, enervata ; superior ovato-lanceolata, subacuta, spiculam aequans, 1-nervata ; valva glumam superiorem similans, 1-nervata ; palea biloba, apice dentata, mox findente ; antherae 0·4 mm. longae, ovatae ; caryopsis, 0·7 mm. longa ; pericarpium in aqua turgescente.

S. stuppeus, Stent, n. sp.

Gramen perenne, caespitosum ; culmi graciles, 11–30 cm. alti, 2–3-nodes ; vaginae infimae breves, angustae, in fibras persistentes mox findentes, bases marginibusque pilis fulvis cincinnis tectibus ; laminae angustissimae, lineares, setaceo-convolutae ; panicula ovata, laxa ; rami solitarii, raro binati, a basi ramuliferi ; ramuli patente-ascendentes ; spiculae 1·75 mm. longae ; glumae hyalinae, acuta vel acuminatae, denticulatae ; inferiore 0·8 mm. longa, enervata, superiore 1·3 mm. longa, 1-nervata ; valva 1-nervata, acuta vel obtusa ; palea truncata, expansa, valvam aequans ; antherae 3, 0·75 mm. longa ; fructus ovata, 0·5 mm. longa.

S. Tysonii, Stent, n. sp.

Gramen perenne, dense caespitosum, rhizoma obliquum ; culmi graciles, ad 30 cm. alti, vaginae basis indurescentes, dense imbricatae, tenuiter striatae ; laminae anguste lineares, planae, apicem versus setaceo convolutae, marginibus ciliates ; panicula anguste ovata ; rami oblique ascendentes, verticillati, a medio denseflori, spiculae ad 4 mm. longae ; glumae inaequales, inferior anguste acuminata, valvam circiter $\frac{1}{3}$ brevior ; superior latior, valvam aequans ; valva glumae superiori similis ; palea valvam aequalis ; antherae 3, 2 mm. longae.

S. usitatus, Stent, n. sp.

Gramen perenne, rhizoma stolonifera ; culmi geniculati, saepe prostrato-ascendentes, 30–45 cm. longi, glabri, laeves teretes, vel basis subcompressis, plurinodi, inferiores breves ; vaginae basis tenuiter membranaceae, glabrae, striatae, mox, marcescentes, superiores firmiores, arctae, glabrae tenuiter striatae ; ligulae ciliatae : laminae lineares, in apice angusto sub-obtuso complicato attenuatae, viridae, glabrae, subtus apicem versus

marginesque scabrae, 4 mm. latae, ad 8 cm. longae; panicula ovato-acuminata, ad 9 cm. longa, 4–5 cm. lata; rami verticillati, vel interdum superiores solitarii, dimidium ad tertiae inferior indivisi; ramuli brevi 1–4 spiculis; spiculae secundae vel subsecundae 2 mm. longae plumbo-viridae; pedicelli brevis, appressi; glumae inaequales, inferior angusto-ovata, obtusa, enervata, spiculae sub-duplo brevior; superior spiculam aequans, acuta; valva glumae superiores similis; palea tenue, mox findata; antherae purpurascens, 1·2 mm. longae; fructus (?).

S. vryburgensis, Stent, n. sp.

Gramen perenne caespitosum; culmi erecti vel-geniculati ad 60 cm. longi, graciles, glabri, laeves, simplices vel saepe ramosile nodis inferioribus; vaginae basales ad 4 cm. longae, angustae, chartaceae, subcompressae, pallidae, leviter sulcatae, laeves, glabrae; ligulae ciliatae; laminae anguste lineares, 2–3 mm. latae, 10 cm. longae, planae vel complicatae, subtus laeves, supra pappilis minutis albidis obtusis tectae; costa subtus albida, 2 nervis primarus lateralibus utrimque onustae; panicula ovato-acuminata, ad 13 cm. longa, 6 cm. lata; rami infimi verticillati ceteri subverticillati vel solitarii, patentes; ramuli brevissimi, appressi plus minusve secundi; spiculae ad 2 mm. longae, pedicellis brevissimis vel 0; glumae inaequales; inferiore hyalina acute vel subacuta, spiculae dimidio breviorei; superiore spiculam equante, obtusa vel subobtusa, 1-nervata; valva glumam superiorem aequans, obtusa vel minute emarginata, 1-nervata, carina scabrida; palea biloba, 2-nerva; antherae 3, 1·2 mm. longae; caryopsis ovata, compressa 1 mm. longa.

SOUTH AFRICAN SPECIES OF CYNODON.

INTRODUCTION.

Nomenclature.

There are two names in use in present-day botanical literature for the genus under revision, *Capriola* and *Cynodon*, most of the important American botanists upholding the former and most of the European botanists the latter.

The case stands as follows:—

In 1763 Adanson published in his "Famille des Plantes" a description of a grass which he called *Capriola*, a name used by the earliest botanical writers, and applied to some grass or group of grasses with digitate inflorescence, but the references to which are too vague to admit of the name being attached to any one particular plant. Adanson was the first botanist to apply this name definitely to one grass, which he describes thus: "Couronne de la gaine des feuilles: poils; fleurs: epis digités; calice: plat par les côtés; corolle: sans arete"; and in the synonomy under *Capriola* is given "Gramen dactylon off."

In 1805, in Persoon's "Synopsis Plantarium," appeared a diagnosis of a grass under the name of *Cynodon* (a Greek rendering of the name "chiendent," by which it was popularly supposed to have been known in earlier botanical literature and under which it is still known in Europe). There could be no doubt as to the identity of the plant referred to, and the name was adopted by subsequent botanists and became firmly established for this small but important genus.

In 1891 Kuntz, in "Rev. Gen. Plant.," II, p. 764, revived Adanson's name, giving his reasons for so doing and pointing out that Adanson undoubtedly had this same grass in mind when he described his genus *Capriola*.

Mr. Theo. Holm opposed this theory in an article entitled "*Cynodon* or *Capriola*," published in *Botanical Gazette* of 1898, p. 47. The greater part of the article is taken up with an attempt to prove that the name *Capriola*, though much in use in botanical records of the earliest times *before* Adanson, could scarcely be taken to refer to one particular species,

but rather to a group of superficially alike grasses of which *Panicum sanguinale* (*Digitaria sanguinale*) was the most distinctive. His arguments make interesting reading, but are not relevant to the discussion, the point of which is whether the grass described by Adanson under the name *Capriola* is the same as that described later in Pers. "Syn. Pl." as *Cynodon*. Holm touches on this point in his last paragraph and attempts to prove that this is not the case. He holds that Adanson's description—ligule composed of hairs, flowers in digitate spikes, calyx (glumes) laterally compressed, corolla (valve) awnless—can just as easily be applied to *Panicum sanguinale*.

As Kuntz, in a later volume of his work ("Rev. Gen. Pl.," III, p. 345), points out, Mr. Holm has omitted all reference to Adanson's index where, in the synonomy of *Capriola*, is given "Gramen dactylon off." Adanson's descriptions are somewhat vague, but this phrase is practically a quotation from the first edition of Linnaeus Species Plantarum where it appears under *Panicum dactylon*. It is, therefore, obvious that this phrase, together with the diagnosis (quoted above), was intended by Adanson to refer solely to *Panicum dactylon* L., which is synonymous with *Cynodon dactylon*, Pers.

It would certainly have been more to the point had Adanson expressly mentioned the former name in his synonomy of *Capriola*, but though his methods were complicated and unsatisfactory, his intentions, at any rate in this instance, were clear.

I would also add that, apart from his sins of omission referred to by Kuntz, Mr. Holm, in upholding his argument, has made statements with which I cannot agree, namely, that *Panicum sanguinale* (= *Digitaria sanguinales*) can be described as having a "ligule composed of hairs . . . calyx laterally compressed." I have never yet seen this *Digitaria* with laterally compressed glumes nor with a ciliate ligule. Mr. Holm also makes the statement in another part of his article that *Cynodon dactylon* never has more than five spikes to the inflorescence, whereas it has as many as seven or eight. Consideration of these facts and arguments leaves no doubt in my mind that Kuntz is right, and that the *Capriola* of Adanson is synonymous with the *Cynodon* of Persoon's synopsis, and that therefore the earlier name has the claim of priority.

The question, however, arises as to the advisability of replacing a name in use for over one hundred years by one recently revived and known to only a few scientists, merely on the plea of priority. *Cynodon* is a well-established name for a cosmopolitan genus of economic value, and under these circumstances I should be very averse to changing it; fortunately, we have the best authority for not doing so, since the name *Cynodon* appears on the list of "Nomina Conservenda" published by the Geneva Conference.

Having decided to accept the name *Cynodon* for this genus, the next controversial point is the authorship of the name. Hitchcock, Beal, Kuntz, Nees, Steudel, Torre, and Harms, etc., attribute it to Richard; while Persoon is credited with it by Bentham, Hooker, Stapf, Hackel, Kunth, etc.

Bentham gives reasons for his attitude in the matter in *Journ. Linn.*, XIX. He says: "We know that he (Richard) declined to attach his name to Persoon's 'Synopsis' chiefly from an unwillingness to sanction the arrangement under the Linnean System, and we are by no means assured that there may not have been other details in both works which he did not concur in. We are, therefore, not justified in fixing on him a responsibility which he refused to undertake; the genera and species first published by Persoon should be quoted as his and not Richard's except where Richard's name is *expressly attached* to them." Bentham's reasoning seems to me very sound. If the name and description of a genus is published in a certain author's work without any author's name attached to it, one must certainly assume that the author of the whole work is the author of that particular generic name, in spite of any unofficial knowledge one may have to the contrary. But as Persoon has "expressly attached" Richard's name to the diagnosis of the genus *Cynodon*, I cannot follow Bentham's logic in attributing the authorship to Persoon, when in accordance with the above reasoning Richard should certainly be held responsible for it. I have, therefore, in this work quoted Richard as the author.

Affinities.

Cynodon is placed in the tribe Chlorideae, in which the spikelets are usually sessile, or sub-sessile, and secund in solitary, sub-digitate, digitate, or racemosely arranged spikes or racemes, rarely are they pedicelled and panicled ; glumes more or less laterally compressed and keeled ; valves 3-nerved (rarely 1–5-nerved), lateral nerves usually distant and sub-marginal, awn, when present, straight from the truncate or notched tip.

Cynodon is nearest in affinity to *Microchloa*, from which it differs chiefly in the size and texture of the valve as compared with the glumes and in the usually long hairs of the former ; the production of the rhachilla is as variable a quantity in *Microchloa* as it is in *Cynodon*, but in at least one species of the former a second usually well-developed floret is *always* present, while in the latter genus this is not the case—though I have found *occasional* spikelets in *C. dactylon*, where the rhachilla terminates in a second well-developed floret, and many where it bears a more or less reduced floret or valve. The valve of *Cynodon* is sometimes minutely pubescent, but never long hairy on the nerves as it is in *Microchloa*. I have, however, seen a form of *C dactylon* from Rhodesia that has a line of fine appressed silky hairs along each marginal nerve of the valve.

Bentham divides the two genera on the habit and on the form of inflorescence, and describes three species of *Cynodon* from Australia besides the cosmopolitan *C. dactylon*. I have not seen specimens of these species, but from the description it is obvious that they belong properly to *Microchloa* and should be placed in that genus.

Taxonomic anb Geographical Notes on the Species,

Cynodon plectostachyum, Pilg. Star grass. A very distinct species intorduced into the Union from East Africa, distinguished from other species by the elongation of the rhachis, the pubescent spikelets, the rather broad flaccid leaves and the anatomy of the leaf blade, which differs from that of all other African species (known to me) in the enlargement of the mid rib ; this consists of a large primary bundle and two secondaries ; the adaxial area is composed of a mass of large irregular parenchymatous tissue devoid of chlorophyll and a small group of hypodermal fibres ; the abaxial half contains chlorophyll tissue as well as the small group of fibres. The group of one large, flanked by two or three smaller thin-walled motor-cells in each groove on the adaxial side is characteristic of the genus, but the band on the opposite side I have only seen in this species. Fig. 1.

Cynodon dactylon, Pers. A cosmopolitan species fairly constant in its essential characters, but varying in height, texture, breadth of leaf, etc., according to locality and conditions under which it is grown.

Cynodon incompletus, Nees, was described by Nees from specimens collected by Ecklon and Zeyher and Drége in the coastal districts of the Cape Province, and appears to be, so far as our records go (I have not seen any of the material from the Bolus Herbarium), confined more or less to those regions.

C. notatus, Nees, I have not seen ; except for the comparative size of the glumes and the valve, Nees's description agrees with our species *C. hirsutus*, but the distribution is so different that without seeing Nees's type I cannot suggest that this inland and, more or less, tropical species corresponds with his *C. notatus*.

Cynodon hirsutus, Stent, is found all over the Transvaal, and occurs also in Southern Rhodesia. We have no records of it from Natal or from any of the coastal regions.

For many years this tropical and sub-tropical grass has been identified as *C. incompletus*, Nees and has been distributed as such by the South African herbaria. Comparison, however, with the coastal species and with Nees's co-type has revealed the fact that the two grasses are quite as distinct in character as they are in distribution. I have not seen Drége's specimen from Little Namaqualand, nor *Atherston* from near Lydenburg, quoted by Stapf under *C. incompletus* in the "Fl. Cap.," VII, 635, but I suspect them of being referable to *C. hirsutus*.

Cynodon transvaalensis, Burtt-Davy. "Germiston gross" and what is known to horticulturalists as "Bradley grass" are both, in my opinion, natural hybrids between *dactylon* and *hirsutus*, as is possibly also *C. Polevansii*. I have not discovered mature seed in any of the plants of these grsases that I have examined.

I have tried to raise plants from seed of *C. dactylon* and *C. hirsutus* taken from specimens growing in close proximity to each other and to Germiston or Bradley, but so far have failed to do so, and apparently the two latter are always sterile. I hope, however, to carry my investigations into this question further and prove what I now only put forward as an hypothesis, based on examinations of the morphological (both external and internal) characters of the five grasses and on observations in the field.

The following is a comparative analysis of the important specific characters of the two species, *dactylon* and *hirsutus*, and of their supposed progeny:—

C. dactylon.

1. Inflorescence of 3–8, mostly 4–5 spikes.
2. The production of the rhachilla beyond the floret.
3. The reduction of the ligule to a ciliate rim.
4. Wingless keel to the valve.
5. Leaves bright green, glabrous.
6. Internal anatomy of leaf: Band of irregular colourless cells penetrating the leaf from the motor-cells of the upper epidermis almost or quite to the lower epidermis; epidermal cells rather regular and not papillate. Fig. 2.

C. hirsutus.

1. Inflorescence of 4–5 spikes.
2. Rhachilla never produced beyond the floret.
3. Ligule distinctly membranous and up to 1·3 mm. long.
4. Keel of valve always narrowly winged.
5. Leaves rather glaucous and hairy.
6. Internal anatomy of leaf: Large motor cells of the upper epidermis separated from lower epidermis by chlorophyl tissue: epidermal cells irregular and papillate, with occasional groups of outstanding oblong cells (forming tubercles) and 1-celled hairs. Fig. 2.

C. transvaalensis.

1. Inflorescence of 2–3, usually 2 spikes.
2. Rhachilla produced in some of the spikelets, but not in all.
3. Ligule usually shortly membranous, but often found as a ciliate rim.
4. Keel of the valve always wingless.
5. Leaves bright green, often hairy.
6. Anatomy of leaf: No band of large irregular colourless cells between the motor-cells and lower epidermis (this character was constant in all sections examined): epidermal cells rather regular, not or scarcely papillate. Fig. 3.

C. Bradleyi.

1. Inflorescence of 3–4, usually 3 spikes.
2. Rhachilla produced in some spikelets of the inflorescence and not in others.
3. Ligule membranous, occasionally reduced to a ciliate rim.
4. Wingless keel to the valve.
5. Leaves hairy and glaucous green.
6. Internal anatomy: No band of irregular colourless cells between the motor-cells and lower epidermis in some sections examined, but other sections exhibited this character; epidermal cells irregular and papillate, often with groups of outstanding oblong cells from which spring unicellular hairs. Fig. 4.

C. Polevansii.

1. Inflorescence usually of 2 spikes.
2. Rhachilla rarely produced.
3. Ligule reduced to a ciliate rim (always ?).
4. Wingless keel to the valve.
5. Leaves glabrous, pallid, rigid.
6. Internal anatomy: Row of irregular colourless cells between motor-cells and lower epidermis; epidermal cells very irregular and densely papillate, no outgrowths. Fig. 5.

It will be seen by comparison of these analyses that the three grasses, *C. Bradleyi*, *C. transvaalensis*, and *C. Polevansii*, combine in a greater or less degree the specific characters of both *dactylon* and *hirsutus*, even to the internal anatomy of the leaf structure. I have examined numbers of specimens of *Bradleyi* and *transvaalensis* from various localities, and find that the degree in which the different characters are present in each hybrid varies considerably: that is to say, in some specimens one will find, perhaps, one spikelet only of the inflorescence without the produced rhachilla, while in other specimens up to about 50 per cent of the spikelets will be without it, and so with the other transmitted characters; it will also be noticed that one important character of *C. hirsutus*, the winged keel, is not reproduced in any of the hybrids.

C. transvaalensis, however, is always distinguished by the very fine narrow glabrous or sparsely hairy leaves and slender runners, by its bright rather yellow-green colour, and by the very slender short culms and usually 2-3-stachys inflorescence, and it is, on the whole, more constant in character than the following.

C. Bradleyi has leaves at least twice as broad as the preceding, always softly hairy, and of a bluish green colour: the runners are slender and usually reddish in colour, and the inflorescence is seldom (never ?) less than 3-stachys, and the membranous ligule is a fairly constant character. It will thus be seen that *transvaalensis* leans more towards *C. dactylon* and *Bradleyi* to *C. hirsutus*.

The sterility of these hybrids would account for the fact that it is possible to procure and keep a pure stand of either.

Both *dactylon* and *hirsutus* are fairly prolific seeders, and are nearly always found growing more or less together. When this is the case, one or both of the hybrids will be found in close proximity to them.

The fact that the two hybrids, Bradley and Germiston, are so distinct from each other, though each exhibits in different degrees the characters of both parents, is possibly due to reverse crosses.

Of the third suggested hybrid, which I have called *Polevansii*, I have little information. I have only seen one collection; the rigid pallid and densely papillose leaves are, as far as I know, characters foreign to both *dactylon* and *hirsutus*. The habitat of *Polevansii* is the dry sandy region of the Lichtenburg District, where, Dr. Pole Evans informs me, there was a distinct and fair-sized patch which he noticed at once as being different from the surrounding quick grasses. It appears to be more tufted in habit than *dactylon*; in its usually distachys inflorescence and short slender 1-noded culms it resembles *transvaalensis*, but the spikelets are considerably longer than in that species and more laxly arranged: the leaves, too, are broader and more rigid and pallid: comparison of the leaf sections of the two will show that *Polevansii* has rather broad bands of sclerenchyma above and below each vascular bundle and on the margin, and a very papillate epidermis: also the large thin-walled colourless cells continue downwards from the sinus of the upper surface to the lower epidermis—all of which characters are lacking in *transvaalensis*. Fig. 5.

I have no records of *dactylon* or *hirsutus* from Lichtenburg, though it is probable that both occur there. It is possible that *Polevansii* is not a hybrid, but the result of a mutation that, being specially suited to its environment and climate, has survived in the struggle for existence.

In the only material I have examined there were no ripe seeds, but the ovaries appeared to be well developed.

Though of these three grasses two are not, and one a doubtful, true species, I have conferred on them specific rank for convenience' sake, because, in the case of *transvaalensis* and *Bradleyi*, they are being cultivated largely, and not bearing mature seed and being propagated vegetatively they will practically always come true to type, and it is necessary that they should have names by which they may be known to science. The same reasons apply to the case of *Polevansii*, except that it is not likely to be brought into cultivation and will have to fight for its right to perpetuate its kind under normal conditions and may lose in the fight; it is, however, well adapted to its environment and may win through and spread and become a firmly established true species or hybrid.

Economic Value,

Medicinal.

The roots of *Cynodon dactylon* are well known as containing medicinal properties, and it is probable that this grass was one of the healing herbs referred to as "gramen dactylon" in ancient herbals. In southern Europe at the present day the roots of *C. dactylon* are often used as a substitute for, or as an adulterant of, those of *Agropyrum repens*, known in pharmacy as "radix graminis."

Fluckiger and Hanbury ("Pharm.," 1879, 2nd ed., p. 730), in comparing the microscopical structure of the rhizomes of the two grasses, state that those of *C. dactylon*, which affords the "gros chiendent" or "chiendent pied-de-poule" of the French, contain a greater number of much stronger fibro-vascular bundles and a cellular tissue loaded with starch, this latter substance being entirely lacking in the tissue of *Agropyrum repens*.

The indigenous African species, *C. hirsutus*, is, according to a correspondent, used by some of the Dutch population in much the same way as *C. dactylon*—a decoction is made from the roots and drunk as a blood purifier and as a cure for indigestion.

Agricultural.

Cynodon dactylon as a pasture grass has a certain value. F. von Muller ("Sel. Ex. Trop. Pl.") writes: "Difficult to eradicate, but for permanent pastures on exhausted land in mild climes not surpassed." In parts of India and in the Southern States of America it is much valued as a pasture and hay grass, especially for horses. In South Africa it seldom attains any height, and is not much valued except occasionally on poor land that will sustain no better growth. It is more generally regarded as a rather troublesome weed that soon takes possession of poor or waste land and overgrazed veld, and is difficult to eradicate.

Cynodon plectostachyum, "Star grass."—A tropical grass introduced into the Union from East Africa, where it is said to be an excellent pasture grass of superlative feeding value. It does well in some parts of the Transvaal, and makes first-class hay, but will stand neither drought nor frost.

Cynodon hirsutus, red quick, is said to be one of the most useful pasture grasses of the high veld, "affording a short but sweet bite to stock, especially mules, horses, and sheep" (Burtt-Davy).

Ornamental.

The most important function of the grasses of this genus is for the making of lawns. *C. dactylon* is known as a lawn grass in most of the warm countries where it occurs; it makes a smooth, compact, but rather coarse lawn, and withstands drought well, but succumbs to frost, soon, however, putting on new growth in the spring. We have no records of lawns of this grass being seriously attacked by either fungus or insect pest. *C. transvaalensis*, Burtt-Davy, "Florida grass," "Germiston grass," is the most popular lawn grass of South Africa; it makes a fine level springy turf, suitable for bowling or golf putting greens and for croquet lawns; the colour is a vivid rather yellow green, and it is not subject to insect or

fungous pests; with a certain amount of moisture Germiston grass will keep green throughout the hottest summer, but not through our frosty, dry winter; in fact, we have not yet found a lawn grass that will keep green the whole year round under normal conditions.

C. Bradleyi, "Bradley grass," has become popular of recent years as a grass for ornamental lawns, but its popularity is on the wane. It is in colour of a much bluer green than Germiston, makes an equally soft fine lawn, but is not quite so hardy, and is subject to the attacks of a nematode that in time will destroy a whole lawn.

DESCRIPTION OF GENUS AND SPECIES.

Cynodon, Rich. in Pers. "Syn. Pl.," 1, 85.

Spikelets laterally compressed, sessile, biseriate, and unilateral on a flattened, and more or less keeled rhachis, usually articulate between the glumes, 1-flowered, with rhachilla produced or not (occasional second floret developed in *C. dactylon*); *glumes* shorter than the valve, keeled, 1–3-nerved, the lower usually persistent; *valve* exceeding the glumes, boat-shaped, with ciliate and sometimes winged keel, 3-nerved, lateral nerves close to the margin, entirely firmly membranous or with hyaline tips and margins, muticous, or with very minute blunt mucro; *pale* equalling or slightly shorter than the valve, 2-keeled, usually with a firmly membranous back and hyaline margins; *lodicules* 2, minute; *stamens* 3; *style* distinct; *stigmas* plumose, laterally exserted; *grain* oblong, glabrous, smooth, not sulcate, free and included in the pale and valve.

Creeping or stoloniferous perennials; *leaves* usually flat, flaccid, or rather firm; *prophyllum* entire (not bifid, as stated by Hackel); *inflorescence* of 1–12 digitate, subdigitate, whorled or scattered narrow spikes; *spikelets* small, more or less imbricating and appressed to the rhachis.

Species, seven in South Africa, one cosmopolitan, and two also found in tropical Africa.

KEY TO THE SPECIES.

Keel of valve not winged
- Rachilla not produced or rarely so in 3 and 5.
  - Valves minutely pubescent; spikes many, whorled or scattered on a short common axis..... 1. *plectostachyum*
  - Valves glabrous (except for dorsal cilia); spikes umbelled.
    - Spikes in pairs, rarely in threes; leaves rather rigid and pallid, glabrous..... 3. *Polevansii*.
    - Spikes 3–4, usually 3; leaves somewhat glaucous, flat, flaccid, hairy..... 5. *Bradleyi*.
- Rhachilla produced, rarely not or only microscopically produced in some of the spikelets of 4 and 5.
  - Culms many-noded, up to 30 cm. high; spikes 3–7 digitate or sub-digitate, 3–5·5 cm. long; a rather coarse creeping grass..... 2. *dactylon*.
  - Culms slender, 2–3-noded, up to 10 cm. high; fine lawn grasses.
    - Spikes 1–3, usually 2; leaf-blades about 1 mm. wide, of a vivid green..... 4. *transvaalensis*.
    - Spikes 3–4, usually 3; leaf-blades up to 2 mm. wide, of a deep rather glaucous green..... 5. *Bradleyi*.

Keel of valve winged; rhachilla not produced.
- Spikelets rather broadly oval, not more than 2 mm. long.
  - Upper glume equalling three-quarters or more of the spikelet, usually 3-nerved; leaves densely hairy..... 6. *hirsutus*.
  - Upper glume shorter; leaves less densely hairy..... var. *parviglumis*.
- Spikelets narrow oval, up to 3 mm. long; upper glumes much shorter; lower often minute; leaves glabrous or sparsely hairy..... 7. *incompletus*.

1. **C. plectostachyum,** Pilg.

Perennial, tufted, with prostrate running stems. *Flowering culms* up to about 50 cm. high, slender, simple or branched, terete, compressible, glabrous, smooth, striate, 2 to many-noded, internodes included or shortly exserted; *leaf sheaths* finely striate, sparsely tubercular, and hairy, more densely so towards the margins; *ligule* membranous, up to over 4 mm. long: *blades* linear, tapering to a fine setaceous point, flaccid, flat, 3–6 mm. wide by about 18 cm. long, finely tubercular hairy on both sides, mid-rib fine and prominent, keeled in the lower part of the blade with 3 primary and 16–18 secondary veins on either side: *spikes* 5–12, whorled, binate, or scattered, on an elongated axis, often with one spike some distance below the first whorl; *rhachis* narrow, keeled, scabrid, minutely spinulously ciliolate along the margins, bearing spikelets from the base: *spikelets* 2·5 mm. long; *glumes* very small, with coarsely scabrid stout keels and minutely rigidly ciliolate margins, lower about 0·3 mm. long, upper 0·6 mm.; *valve* stoutly keeled, not winged, keel rigidly

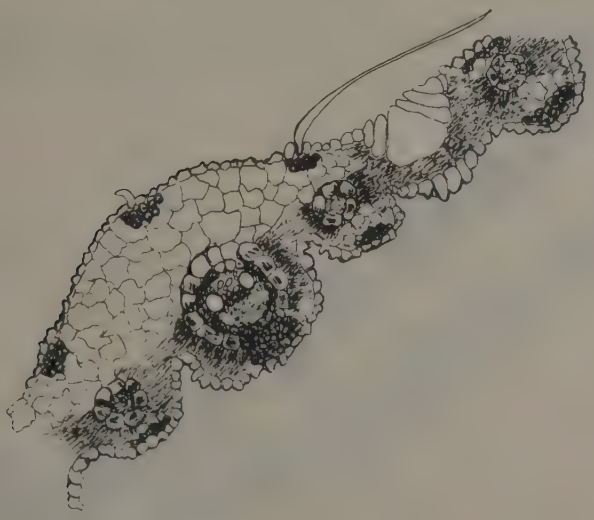

Fig. 6.

C. plectostachyum. Transverse sections of leaf-blades.

ciliate and produced into a short mucro, minutely pubescent on the back towards the margins: *palea* equalling or slightly exceeding the valve, 2-keeled, minutely pubescent between the minutely pectinate scabrid keels, rhachilla not produced; *anthers* 3, 1·5 mm. long: *stigmas* plumose from the middle; *lodicules* small, cuneate: *grain* linear oblong.

Pretoria: In grounds of Division of Botany (introduced) (H. 19251, in *National Herb.*).

2. **C. dactylon,** Pers.

Prostrate ascending and creeping perennial, sending out long underground and surface runners that root and shoot from the nodes. *Flowering culms* erect or sub-ascending, many-noded, the lower internodes very short, the upper gradually longer, smooth, glabrous, slender, from 7 to 30 cm. high: *leaf sheaths* smooth, hairy, or glabrous, except at the hairy mouth, lower short, but usually exceeding the internodes and, more or less, closely imbricating, upper longer and tightly enveloping the culms: *ligule* reduced to a short densely ciliate and fimbriate rim about 0·4 mm. long; *blades* narrow linear, 2-10 cm. long, up to 5 mm. wide, acutely acuminate or more often obtuse, glabrous, or hairy on the upper surface with tubercle based hairs, smooth except on the minutely scaberulous margins or scabrid

on the upper surface, mid-rib fine and prominent, with 2 primary and 8–9 secondary nerves on either side; *spikes* 3–5 (usually 4), seldom 2, digitate or sub-digitate, 3 5·5 cm. long, rhachis narrow, straight, keeled on the back, glabrous except at the base, smooth with minutely scaberulous margins, bearing imbricating spikelets from about 1 mm. above the base: *spikelets* oblong, elliptic, acute, up to 3 mm. long; *glumes* sub-equal, seldom equalling less than 0·5 of the spikelet and sometimes as long, acute, strongly 1-nerved with scabrid keel, upper glume somewhat broader than the lower; *valve* narrow and sub-acutely acuminate or ovate and sub-obtuse, 3-nerved, the mid-nerve sometimes produced from just below the tip into a minute mucro, keel shortly and more or less appressedly ciliate, not winged; *pale* equalling the valve, narrow oblong, canaliculate between the stout scabrid keels; *rhachilla* produced and often bearing a reduced floret; *lodicules* ovate, obtuse, about 0·25 mm. long; *anthers* 3, about 1 mm. long; *ovary* ovate; *stigmas* plumose, distinct, except at the very base.

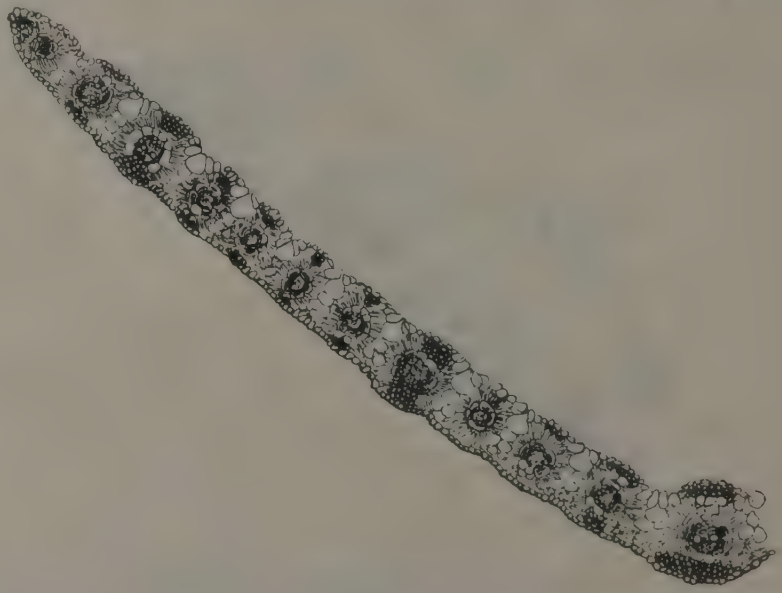

Fig. 1.
C. dactylon.

Cape Province.—Coastal District, South-West: Capetown, Claremont Flats, *Schlechter* 151 (*Herb. Alb. Mus.*); Kenilworth, *F. Bolus* (*Nat. Herb. Pret.*); Green Point, *Zeyher* 4519 (*Alb. Mus. Herb.*). South: Riversdale, *Muir* 3615 (*Nat. Herb. Pret.*); Humansdorp. Flats Witte Els Bosch, *Fourcade* 997 (*Herb. Alb. Mus.*); Uitenhage, Zwartkopsriver, *Zeyher* 4520 and 446 (*Herb. Mus. Austr.-Afr.*); "Aloes," near Port Elizabeth, *Burtt-Davy* 11957 (*Nat. Herb. Pret.*); "Kaffraria," *Baur* 267 (*Alb. Mus. Herb.*). South-East: About homesteads, Komgha, *Flanagan* 1009 (*Nat. Herb. Pret.* and *Alb. Mus.*); Kentani, *Pegler* 246 (*Nat. Herb. Pret.* and *Alb. Mus. Herb.*); near Grahamstown, *MacOwan* 2119 (*Herb. Mus. Aust.-Afr.*); Katberg, near Sanatorium, *Schönland* 4342 (*Alb. Mus. Herb.*); Kowie, *Tyson* (H. 21822 in *Nat. Herb. Pret.*); Grahamstown, *Glass* 586 (*Herb. Mus. Aust.-Afr.*); Central District: Kuruman, *Mogg* 7695 (*Nat. Herb. Pret.*); Armoedsvlakte, Vryburg. *Theiler* (H. 20287 in *Nat. Herb. Pret.*).

Natal Province.—Berea, Durban, *Wood* 5930 (*Nat. Herb. Pret.*, *Alb. Mus. Herb.*, *Herb. Mus. Aust.-Afr.*).

Transvaal.—Pretoria District: Pretoria, *Leendertz* 1079 (*Nat. Herb. Pret.* and *Trans. Mus. Herb.*), *Mogg* (H. 16905 in *Nat. Herb. Pret.*), *Lounsbury* (H. 21823 in *Nat. Herb. Pret.*); *Leendertz* 3865 (*Trans. Mus. Herb.*); Zwartspruit, *Burtt-Davy* 7108 (*Nat. Herb. Pret.*); Groenkloof, Old Natal Road, *Pole Evans* 320 (*Nat. Herb. Pret.*); Johannesburg, Hospital Hill, *Bryant* A. 30 (*Nat. Herb. Pret.*); Germiston, *Fenn* (H. 8746 in *Nat. Herb. Pret.*), *Leendertz* 6073 (*Trans. Mus. Herb.*); Irene, Doornkloof, *Pole Evans* 563 and 224 (*Nat. Herb. Pret.*); Barberton, *Pott* 5530 (*Trans. Mus. Herb.*); Komatipoort, *Burtt-Davy* 368 (*Nat. Herb. Pret.*). Waterberg: Pietpotgietersrust, *Leendertz* 6688 (*Trans. Mus. Herb.*); Naboomspruit, *Galpin* M. 430 (*Nat. Herb. Pret.*); near Nylstroom, *Burtt-Davy* 2080 and 2033 (*Nat. Herb. Pret.*); Bushveld, *Reck* (H. 3533 in *Nat. Herb. Pret.*). Zoutpansberg: Tzaneen, *Sampson* (H. 4391 in *Nat. Herb. Pret.*); Rikatla, *Junod* 68 (*Trans. Mus. Herb.*); the Downs, *Junod* 4101 (*Trans. Mus. Herb.* and *Nat. Herb. Pret.*); Woodbush, *Wager* (*Trans. Mus. Herb.* 12520). Lichtenburg: Lichtenburg, *Burtt-Davy* 58 (*Nat. Herb. Pret.*). Bloemhof: Schweizer Reneke, *Burtt-Davy* 1634; near Bloemhof, *Burtt-Davy* 1515 (*Nat. Herb. Pret.*); Christiana, *Burtt-Davy* 14094 (*Nat. Herb. Pret.*). Marico: Zeerust, *Leendertz* 11319 (*Trans. Mus. Herb.*). Lydenburg: Lydenburg, *Wilms* 12431 (*Trans. Mus. Herb.*); Pilgrims Rest, *Legat* (H. 1585 in *Nat. Herb. Pret.*); Middelburg, *Hewitt* (*Trans. Mus. Herb.* 12070: Standerton, *Leendertz* 11010. (*Trans. Mus. Herb.*: Heidelberg, Vereeniging *Burt-Davy* 5052 (*Nat. Mus. Pret.*); Henley-on-Klip, *Stent* (H. 21609, H. 21590 in *Nat. Herb. Pret.*).

Fig 5.
C. Polevansii.

Orange Free State. Maccavlei, Heilbron, *Brandmuller* 104 (*Nat. Herb. Pret.*); Bloemfontein, *Beck* (H. 21794 in *Nat. Herb. Pret.*).

A cosmopolitan species that seeds freely and is very variable in its habit. Junod's specimen from Rikatla is an unusually flaccid form with thin flat leaves resembling more some forms of *C. incompletus* in its habit; the same collector's 4101 from Downs is small and fine, with very narrow leaves and slender culms, and is scarcely distinguishable from *C. transvaalensis*. My specimen, H. 21590, from Henley-on-Klip, exhibits a form with very stout, rigid, many-jointed runners about 2 mm. in diameter with short internodes, the intravaginal shoots densely fascicled at each node, and the lowest sheaths short, broad, straw-coloured, and almost bladeless.

3. Cynodon Polevansii, Stent. n. sp.

Perennial, densely caespitose, rhizomes branched, and creeping stems short, prostrate, densely beset with short flowering and barren shoots, and covered with the persistent

sheath bases. *Flowering culms* erect or ascending, very slender, 2-noded, 6–8 cm. high (excluding inflorescence), nodes slightly contracted, glabrous, dull greenish, about 1 mm. long, internodes, usually exserted; *lower sheaths* and those of barren shoots mostly short (about 6–10 mm. long), broad, loose, finely ribbed, smooth, glabrous except at the long hairy mouth, culm sheath tightly rolled; *ligule* a very narrow fimbriate membranous rim, sparsely long hairy from the back; *blades* short, linear-cuneate, obtuse, rigid, flat or more often folded and, more or less, navicular, up to 2 cm. long by 2 mm. broad near the base, scabrid on the margins and keel and minutely so all over on the upper surface, glabrous, glaucous, finely 13-ribbed, mid-rib acutely keeled below, scarcely prominent above (blade of the uppermost culm-leaf much reduced). *Inflorescence* of 2 3-umbellate shortly peduncled spikes, spikes up to 2 cm. long, rather lax; *rhachis* pubescent at the base for 2·3 mm., otherwise glabrous or very microscopically pubescent, scabrid on the margins, about 0·5 mm. broad, usually flat on the back with a raised straight or wavy mid-rib on the face, bearing loosely appressed spikelets from about 2·3 mm. above the base. *Spikelets* rather narrow, oval, 3–3·3 mm. long, glabrous; *glumes* sub-equal, equalling about half the spikelet, strongly keeled, acute, glabrous, scabrid on the keels, lower sub-falcate, upper slightly broader and flatter; *valve* navicular with hyaline obtuse or sub-acute tip, hyaline margins, keel scabrid towards the tip, long, and softly ciliate below; *pale* acute with hyaline margins, equalling

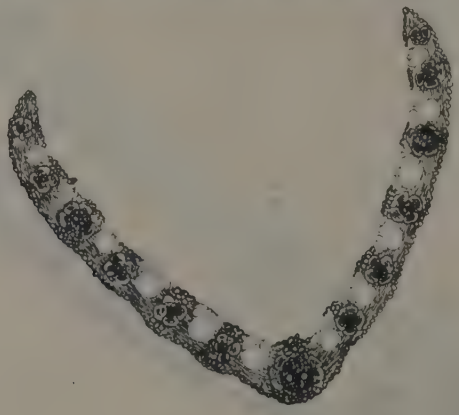

Fig. 3.

C. transvaalensis.

or slightly exceeding the valve, shallowly or, at the base, rather deeply canaliculate between the smooth keels, rhachilla not or microscopically produced, rarely in occasional spikelets long and bristlelike; *stamens* 3; *ovary* narrow, ovoid; *stigmas* laterally exserted, dark purple plumose from the middle; *lodicules* thinly fleshy, broadly cuneate, about 0·4 mm long.

Transvaal.—Barbers Pan, Lichtenburg District, *Pole Evans* 334. Very near to *C. transvaalensis*, from which it differs in the longer and more loosely arranged spikelets, rhachilla not produced, rigid and somewhat glaucous leaves, etc.

4. C. transvaalensis, Burtt-Davy (Kew Bul., 1921, p. 281).

Perennial; long creeping stems, glabrous, smooth, purplish, very slender, about 1 mm. diameter, often rooting and sending forth from the nodes fascicles of short upright barren and flowering shoots and prostrate branches. *Culms* very slender, 5–10 cm. high, 2–3-noded, often branched from the lowest node, glabrous, sulcate, slightly contracted at the nodes; *sheaths* of the leaves smooth, finely striate, glabrous, or with a few scattered hairs, bearded at the mouth, the lowermost broad, short, lax, straw-coloured or purplish, those of the culm longer and tightly or rather loosely convolute; *ligule* membranous up to 0·4 mm.

long, and more or less fimbriate, or reduced to a ciliate rim ; *blades* narrow, linear, subulate, about 1 mm. wide and up to 5 cm. long, obtuse to sub-acute, sometimes minutely apiculate, more or less hairy all over from tubercle based hairs, flaccid, green. *Inflorescence* consisting of 1-3, usually 2, digitate spikes terminating the culms ; *spikes* short, 1-2 cm. long ; *rhachis* narrow, 0·3-0·5 mm. wide, more or less, flattened with a straight or flexuous rounded keel on the face, scabrid on the margins, glabrous except at the often microscopically pubescent base. *Spikelets* more or less imbricating, oval, 2-2·5 mm. long, pallid, glabrous, except the keel, arranged on alternate notches of the rhachis, from 1-4 mm. above the base ; *glumes* somewhat unequal, acute to sub-acute, firmly 1-nerved with scabrid keels, upper equalling about half the spikelet, lower somewhat shorter ; *valve* membranous, with hyaline margins and tip, 3-nerved, side nerves long, mid-nerve minutely excurrent below the hyaline tip, keel ciliate, not at all winged, cilia about 0·25 mm. long ; *pale* equalling or slightly exceeding the valve, with broadly rounded or cuneate and narrowly truncate hyaline tip, deeply canaliculate between the minutely scaberulous keels, rhachilla produced and bristle-like, or in some spikelets not produced ; *stamens* 3 ; *lodicules* very small (about 0·3 mm.), cuneate, fleshy stigmas purple, plumose from above the middle ; *ovary* ovoid ; grain ?.

Transvaal.—Uitval, Vereeniging, *Turner* (*Nat. Herb. Pret.* H. 21224 ; Lake Chrissie, Ermelo District, *Burtt-Davy* 9270 (*Nat. Herb. Pret.*) : Burgers Park, Pretoria (Cult.), *Stent* (*Nat. Herb. Pret.* H. 10799) : Orange Grove, Johannesburg, *Bryant* C. 10 (*Nat. Herb. Pret.*).

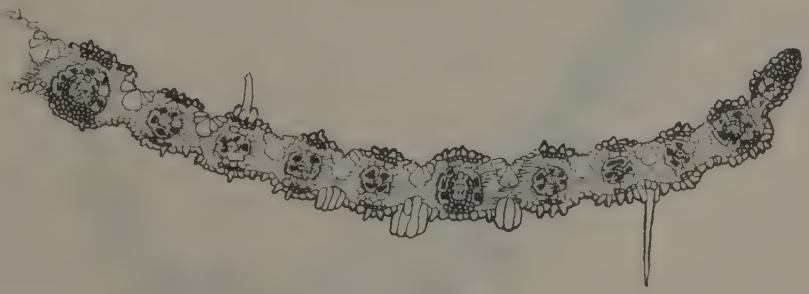

Fig. 4.
C. Bradleyi.

Orange Free State.—Kroonstad, *Hoffman* (*Nat. Herb. Pret.* H. 10802) : Bloemfontein, *Beck* (*Nat. Herb. Pret.* H. 21795).

Natal.—Country Club, Durban (Cult.), *Mackay* (*Nat. Herb. Pret.* H. 21824).

A very fine grass, much used for lawns. Appears to be a hybrid between *C. dactylon* and *C. incompletus*. It does not seed, but is propagated solely by roots and runners, and therefore remains more or less constant to type.

5. C. Bradleyi, Stent, n. sp.

Creeping perennial. *Flowering culms* 1-2 noded, glabrous, smooth, finely striate, internodes enclosed or shortly exserted ; *sheaths of leaves* glabrous or sparsely hairy, smooth, striate ; *ligule* distinctly membranous, up to 1 mm. long and ciliate, seldom reduced to a ciliate rim ; *blades* hairy from tubercle-based hairs, scabrid on the margin, 0·5-2 cm. long and about 1·5 mm. wide at the base, tapering to an obtuse apex, finely nerved, mid-rib, with 2 primary and 8-9 secondary nerves on either side, nerves fine but distinct, prominent on the under surface. *Spikes* 2-4, usually 3 ; *rhachis* sharply keeled, about 0·5 mm. wide, deeply and bluntly toothed on the margins at the insertion of the spikelets, rather long hairy at base and often bearing spikelets from near the base or from up to 2 mm. above. *Spikelets* imbricate, elliptic, and unequal-sided, glabrous, 2·5 mm. long ; *glumes* sub-equal, equalling about half the spikelet, 1-nerved with prominent green, smooth

keel ; *valve* sub-acute, glabrous except on the ciliate keel ; *pale* equalling the valve with two firm green scabrid keels ; *lodicules* minute, cuneate, fleshy ; anthers 3 ; *stigmas* plumose, laterally exserted ; *ovary* ovoid ; grain not seen.

TRANSVAAL.—Orange Grove, Johannesburg, *Stent* (in Nat. Herb. Pret. H 21852) : *MacDonald* (in Nat. Herb. Pret. H. 21849).

Both specimens were from unbroken veld and occurred in close association with *C. dactylon* and *C. hirsutus*.

In the National Herbarium are several other specimens of Bradley grass taken from cultivated lawns and golf greens at Pretoria, Johannesburg, Durban, and Bloemfontein. Probably a hybrid.

6. **C. hirsutus,** Stent. n. sp.

Creeping perennial. *Flowering culms* 1 2-noded, glabrous, smooth, finely striate : *sheaths of leaves* glabrous or finely hairy, smooth, striate, those of the basal and barren shoots short, 1·2 cm. long, those of the culm longer, rather loose ; *ligule* membranous,

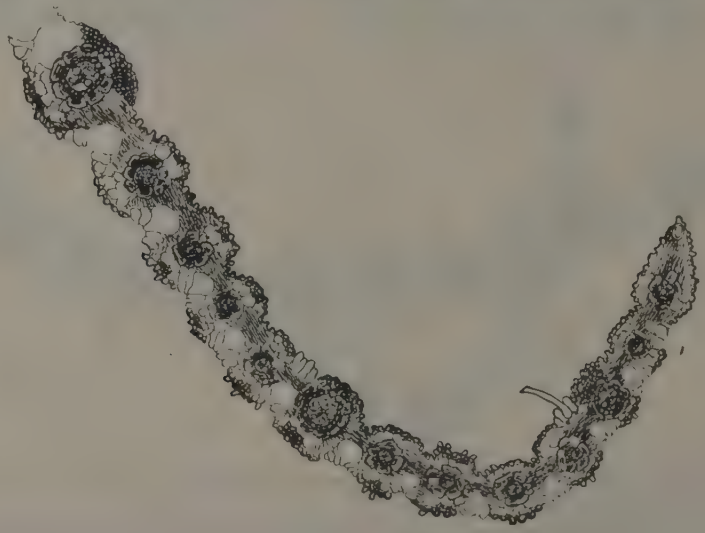

Fig. 2.
C. hirsutus.

ovate, acute, irregularly toothed or fimbriate, up to 1·3 mm. long ; *blades* rather blue-green, linear, tapering to a fine point, up to 7 cm. by 4 mm., usually shorter, hirsute on both sides from tubercle-based hairs, finely but distinctly ribbed, lateral primary nerves on either side the mid-rib 2, distinct with 10-11 fine but distinct secondary nerves. *Spikes* 4-5 (rarely with one spike some distance below the umbel) ; *rhachis* straight or somewhat flexuous, glabrous, more or less deeply and bluntly toothed on the margins at the insertion of the spikelets, about 1 mm. broad, flat or somewhat concave on the face, keeled (sometimes obscurely so) and purplish on the back, pubescent at the very base, and bare of spikelets for 2·5 mm. *Spikelets* crowded, imbricate, 2-2·5 mm. long, scarcely gaping : *glumes* unequal to sub-equal, lower equalling from half to two-thirds of the spikelet, ovate, acute, 1-nerved, stoutly keeled, keel narrowly winged below, obscurely ciliate, upper sub-equalling or slightly exceeding the spikelet, usually 3-nerved, nerves greenish, rather stout, lateral shorter, evanescent above, keel scabrid, not or very obscurely and shortly winged near the base ; *valve* ovate, obtuse, glabrous, keeled, keel with a shortly ciliate wing in the

upper half; *pale* equalling the valve, 2-keeled, minutely bilobed, flat between the scabrid keels or slightly canaliculate below, rhachilla not produced; *anthers* 3; *stigmas* plumose; *ovary* ovate obtuse; *lodicules* truncate, obtuse, or minutely bilobed, 0·3 mm. long.

Var. *β* **parviglumis,** Stent.

Glumes shorter than in the type, never 3-nerved, whole plant less densely hairy.

Transvaal. Ermelo, Spionkop, *Burtt-Davy* 9262; near Morgenzon, *Burtt-Davy* 1011; Carolina, *Burtt-Davy* 2713; Lydenburg District, Helvetia, near Lydenburg, *Burtt-Davy* 7245; Zoutpansberg, New Agatha, *Burtt-Davy* 1214.

Natal.—Meteor Ridge, Mooi River, *Mogg* 3368 (*Nat. Herb. Pret.*).

Var. *β*.

Transvaal.—Bloemhof District, Banks of Vaal River, *Burtt-Davy* 1516; Schweizer Reneke, *Burtt-Davy* 1635; Fourteen Streams, *Burtt-Davy* 1555. Pretoria District, Pretoria, *Lounsbury* (*Nat. Herb. Pret.*).

Fig. 7.

C. incompletus.

Basutoland.—Leribe, *Dieterlen* 6340 (*Herb. Mus. Aust.-Afr.*).

The type is a more or less tropical grass: we have it also from Rhodesia: the variety seems to be chiefly confined to the drier regions of the western sand veld.

7. C. incompletus, Nees.

Creeping perennial. *Flowering culms* erect or sub-geniculate, up to 24 cm. high, 1–2-noded, and usually branched from the lowest node, smooth, glabrous, striate; *sheaths* glabrous, of barren shoots up to 4 cm. long, rather lax, of the culm longer and tighter: *ligule* membranous, 1–1·3 mm., obtuse; *blades* flaccid, up to 12 cm. long by 3 mm. wide, those of the culms shorter, glabrous, or sparsely hairy, minutely scaberulous on both sides, scabrid on the margins, primary lateral nerves distinct, two on either side the prominent mid-rib. *Spikes* 3–5, usually 4, in a terminal umbel, rarely one spike a little distance below the other: *rhachis* glabrous, about 0·75 mm. wide, flat on the face, with scabrid margins and dorsal keel. *Spikelets* 3 mm., obliquely and narrowly oval; *glumes* unequal, lower small, 1-nerved, upper 1–1·5 mm. long, ovate, acute, with scabrid keel: *valve* glabrous.

3-nerved, with hyaline margins, obtuse t p, and a narrowly winged and rather rigidly ciliate keel; *pale* equalling the valve, obtuse or obtusely accuminate, with two rigid scabrid keels, canaliculate between; *anthers* 3; *ovary* ovate.

Cape Province.—Albany District, Cradock Road, near Grahamstown, *Schönland* 4391 (*Alb. Mus. Herb.*); Carlisle Bridge, *Bowker* 8 (*Alb. Mus. Herb.*); Steenbokvlagte, Uitenhage, *Ecklon and Zeyher Gub.* (*Alb. Mus. Herb.*); Queenstown, Plains near Klass Smits River Bridge, *Galp.* 2353 (*Nat. Herb. Pret., Alb. Mus. Herb.*); Humansdorp, *Fourcade* 2553 (*Nat. Herb. Pret.*); Hanover, *Sim and Galp.* 6261 (*Nat. Herb. Pret.*); Grahamstown, *Daly and Sole* 157 and 2641 (*Alb. Mus. Herb.*); Camdeboosberg, *Drége* (*Herb. Aust.-Afr.*, 19484); Honey Nest Kloof, *Wilman* (*Nat. Herb. Pret.* H. 21825); near Grahamstown, *Schönland* 4391 (*Alb. Mus. Herb.*); Port Elizabeth, *Bishop* (*Nat. Herb. Pret.* H. 21848).

Ecklon's specimen from Steenbokvlagte does not appear to be the one quoted by Nees under his species *C. notatus*, since it has unequal glumes and is quite glabrous; it is probably Zeyher's from Uitenhage quoted under *C. incompletus*.

SOME CHANGES IN NOMENCLATURE.

In *Bothalia*, Vol. I, p. 170, I published the description of a grass, *Galpin* M. 447, from the Waterberg, for which I established a new genus, *Mosdenia*, with a single known species, *M. waterbergensis*.

The Director of Kew has now brought to my notice Hackel's *Perotis phleoides* based on *Schlecter* 4200 from Hammanskraal and described in "Viert. Nat. Ges. Zurich," XLIX (1904) (a publication to which I have not had access). In order to include the grass in *Perotis*, Hackel created a new sub-genus, *Tropidachne*. From the description it would appear that this grass is identical with my *Mosdenia waterbergensis*. The Director of Kew has kindly had *Schlechter's* 4200 (of which we have no specimen in the National Herbarium) compared with *Galpin* M. 447, and reports that the two are certainly the same grass.

I cannot agree with Hackel that the grass should find a place in the genus *Perotis;* the sessile spikelets, unawned gibbous glumes, and length of the valve and pale are sufficient to differentiate it.

Since, however, Hackel's specific name has priority, I propose renaming the grass *Mosdenia phleoides*.

In the same number of *Bothalia* I published the description of a new species of *Eragrostis* under the name of *Eragrostis valida*. It has since been brought to my notice that in 1915 Pilger published, in "Wiss. Ergel. Schwed. Rhod. Kongo. Exped." (a publication not available in South Africa and not indexed in the most recent part of the "Index Kewensis"), the description of a tropical species of *Eragrostis* under the same specific name. I have not seen a specimen of Pilger's *Eragrostis valida*, but from the description it is not the same grass as mine of the same name. To avoid confusion, therefore, I propose to rename my species *Eragrostis robusta*.

CELASTRACEAE, R.BR.

By J. D. DAVISON, B.A., Division of Botany, Pretoria.

THIS is a large widely distributed family, found chiefly in the warmer parts of Europe, North America, and Asia, with outliers in temperate South America and in Australia, and numerous species in South Africa. The members of the family are large trees, sometimes reaching a height of forty to fifty feet, or shrubs, erect or climbing, and often bearing spines. Considered as a whole, the family is not economically important. One member, *Catha edulis*, is used as a beverage by the natives, and Harvey affirms that "the leaves chewed to excess have intoxicating effects." It is a rare shrub in South Africa. Other members, e.g. *Cassine sp.* and *Hartogia sp.* yield useful timbers, but are not used to any very large extent.

I have retained nine genera in the family. The chief character used to differentiate the genera is the fruit. I grant that this should be supplemented by other characters where it is possible, as the material is more often than not incomplete, but it has been impossible to do this in most cases as it appears to be the one stable character in a family where both the genera and species are very variable.

I have combined *Cassine*, *Elaeodendron*, *Scytophyllum*, and *Mystroxylon* in one genus *Cassine*, as in my opinion there are no generic differences between them.

I have to acknowledge with thanks the loan of specimens from the Albany Museum Herbarium, Forest Department Herbarium, South African Museum Herbarium, Maritzburg University College Herbarium, and Dr. R. Marloth, and I also wish to thank Mrs. F. Bolus for her courtesy in allowing me to work at the Bolus Herbarium and use the material there. I am greatly indebted to the Director at Kew for allowing me to work in the Herbarium and use the material, and to Mr. J. Hutchinson, of Kew, and Dr. E. P. Phillips, in charge of the National Herbarium, for invaluable assistance, without which this work would not have been completed.

CELASTRACEAE.

Trees or shrubs, sometimes twining, armed or unarmed. *Leaves* opposite or alternate, petiolate or subsessile, simple, membranous or coriaceous, sometimes glaucous, entire or toothed, with the veins reticulate, distinct or obsolete; stipules small, mostly caducous. *Inflorescence* cymose or fasciculate, axillary. *Flowers* 4–5-partite, small, clustered, green or white, bisexual or unisexual. *Calyx* 4–5-partite, imbricate in aestivation, persistent; segments entire or lacinated. *Petals* 4–5, alternate with the sepals, imbricate in aestivation, deciduous. *Stamens* 4–5, inserted under or on the edge of the disc; filaments often dilated at the base, usually short; anthers introrse, erect, longitudinally dehiscent, basi- or dorsi-fixed. *Disc* fleshy, 4–5-lobed or entire, more or less surrounding and at times partially enveloping the ovary. *Ovary* sessile, sometimes partially sunk in the disc, usually free, 1–5-chambered; style thick, 2–5-lobed, with usually 2, sometimes 3–6, erect or pendulous ovules. *Fruit*, 1–5-locular, a dehiscent capsule or an indehiscent berry or drupe, or (in *Cassine*) an indehiscent drupe-like fruit, with more or less leathery epicarp, and membranous endocarp (when present). *Seed* with or without an arillus, endospermous or exendospermous.

KEY TO THE SOUTH AFRICAN GENERA.

Leaves alternate:

- Fruit winged..... *II. Pterocelastrus.*
- Fruit not winged:
  - Each ovary-chamber 3–6-ovuled..... *IV. Putterlickia.*
  - Each ovary-chamber 2-ovuled:
    - Fruit a dehiscent capsule..... *I. Gymnosporia.*
    - Fruit a dry or fleshy indehiscent drupe..... *III. Cassine.*

Leaves opposite:

- Style lateral in fruit; pistil monocarpellary..... *VII. Pleurostylia.*
- Style terminal in fruit; pistil consisting of more than 1 carpel:
  - Fruit a dehiscent capsule..... *VI. Catha.*
  - Fruit a dry or fleshy indehiscent drupe:
    - Ovules pendulous..... *VIII. Maurocenia.*
    - Ovules erect:
      - Inflorescence a raceme..... *V. Lauridia.*
      - Inflorescence a cyme:
        - Seed exendospermous..... *IX. Hartogia.*
        - Seed endospermous..... *III. Cassine.*

I. GYMNOSPORIA, Wight and Arn.

Trees or shrubs, armed or unarmed. *Leaves* alternate, petioled, entire or toothed. *Inflorescence* cymose. *Flowers* 5-parted. *Sepals* with irregular laciniated or ciliated margins. *Petals* larger than the sepals. *Disc* fleshy, flat or collar-like. *Ovary* 3-chambered, with 2 ovules in each chamber; style short or long; stigmas 3, or more or less 2–3-lobed. *Fruit* a dehiscent capsule. *Seeds* with a complete or incomplete aril.

I. *Fasciculatae:* Pedicels simple, fasciculate, articulated:

- Branches spiny, flowers almost sessile:
  - Flowers clustered in dense sub-sessile glomerules; leaves rounded at the apex or mucronate..... 1. *capitata.*
  - Flowers pedicellate in the axils of the leaves; leaves acute 2. *uniflora.*
- Branches not spiny; pedicels usually well-developed:
  - Leaves entire or sub-entire, small, not exceeding 3 cm., with recurved margins:
    - Leaf always exceeding 2 cm. in length, more or less orbicular, not cuneate..... 3. *lucida.*
    - Leaf never exceeding 1 cm. in length, obovate, cuneate..... 4. *Zeyheri*
  - Leaves toothed, usually fairly large and exceeding 2 cm. in length, up to 6 cm. in length, except in *G. Zeyheri* where leaves are 2–2·5 cm. long:
    - Pedicels articulated at the base or very near the base:
      - Leaves ovate or ovate-lanceolate, acuminate, rounded at the base..... 29. *acuminata*, var. *microphylla.*
      - Leaves obovate or rounded-obovate not acuminate at the apex, distinctly cuneate at the base:
        - Leaves coarsely repand-dentate, with about 3–4 teeth on each side.

Flowers sub-sessile or very shortly pedicellate; pedicel never exceeding 3 mm. ..... 4. *Zeyheri.*

Pedicels averaging 0·5–1 cm. articulated ..... 5. *ilicina.*

Leaves serrate, with more numerous teeth. 6. *undata.*

Pedicels articulated well above the base or near the middle:

Leaves with few (3–5) teeth and strongly recurved margins, not pointed; lateral nerves about four ..... 7. *procumbens.*

Leaves with several teeth and not or slightly recurved margins, mostly acuminate; lateral nerves several:

Leaves lanceolate or lanceolate-ovate; articulation more towards the base than the middle of the pedicel ..... 9. *fasciculata.*

Leaves oblong-ovate not glaucous; articulation more towards the middle of the pedicel ..... 9. *Peglerae.*

Leaves more or less obovate, white or whitish, glaucous beneath; articulation more towards the middle than the base of the pedicel:

Pedicels under 1 cm. long; leaves less than 10 cm. long ..... 10. *albata.*

Pedicels 1·5–2 cm. long; leaves 10–15 cm. long ..... 11. *deflexa.*

II. *Cymosae:* Inflorescence a cyme:

Leaves sessile, cordate at the base; inflorescence very few-flowered ..... 12. *cordata.*

Leaves petiolate, not cordate; inflorescence usually several flowered:

Leaves long and linear or small and fasciculate; branchlets mostly spiny and often *Berberis-like* shrubs; leaves entire or nearly so:

Unarmed plants; branchlets of one kind with scattered leaves; fruit 2-valved, succulent.

Flowers very small; midrib prominent on under surface of leaf ..... 13. *monococca.*

Flowers larger; leaf veinless ..... 14. *angustifolia.*

Branchlets of two kinds, of long shoots and short shoots, with usually fasciculate leaves; fruits (where known) 3-valved, not succulent:

Spines large, up to 9 cm. long.

Leaves oblanceolate or linear-oblanceolate; inflorescence compact, shorter than the leaves; pedicels 1–1·5 mm. long; peduncle never exceeding 6 mm. 15. *polyacantha.*

Leaves obovate-cuneate; inflorescence lax; pedicels 4–5 mm. long; peduncle 1 cm. or more long ..... 16. *integrifolia.*

Spines when present very small and slender:

Peduncles 1 cm. long; petals about 4 mm. long ..... 17. *saxatilis.*

Peduncles about 0·5 cm. long; petals less than 2 mm. long ..... 18. *vaccinifolia.*

Leaves distinctly toothed:

Flowers numerous, very densely glomerate on the spiny branches ..... 19. *condensata.*

Flowers few or laxly arranged:

Leaves long-linear, or lanceolate, about 8 cm. long (remotely toothed):

Leaves linear, one-nerved, 2–7 mm. wide, with a distinctly denticulate margin ... 20. *linearis.*

Leaves lanceolate, penni-nerved, 5–12 mm. wide, with a closely denticulate margin 21. *lanceolata.*

Leaves shortly linear, not more than 5 cm. long.

Leaves fasciculate, narrowed towards the base only; entire or slightly toothed,

Leaves submembranous, with a conspicuous straw-coloured midrib; peduncle very slender ..... 22. *tenuispina.*

Leaves coriaceous, with an inconspicuous midrib; peduncle stoutish 23. *elliptica.*

Leaves not fasciculate, narrowly lanceolate, narrowed to each end, distinctly toothed 24. *Bachmannii.*

Leaves mostly oblanceolate, obovate, ovate, or rounded, fairly large; spines sometimes absent:

Branches and peduncles pubescent; leaves usually well over 5 cm. long, elliptic or elliptic-ovate, narrowed slightly towards the base; branches not spiny ..... 25. *peduncularis.*

Leaves not more than 3 cm. long, ovate or ovate-rounded, sub-cordate at the base; branches with slender spines ..... 26. *rubra.*

Branches and peduncles glabrous.

Leaves entire ..... 27. *laurina.*

Leaves toothed.

Leaves elliptic, rhomboid, ovate, or ovate-lanceolate; branches not spiny, all of one kind; the leaves not fasciculate:

Pedicels about 2 cm. long or more; leaves rounded at the base ..... 28. *filiformis.*

Pedicels up to 0·5 cm. long; leaves shortly cuneate at the base ..... 29. *acuminata.*

Branches spiny, of two kinds, long shoots and short axillary shoots with fasciculate leaves ..... 30. *harveyana.*

Leaves obovate or oblanceolate or somewhat rounded, wider towards the top.

Inflorescence very densely glomerate; the flowers sub-sessile ..... 31. *crataegiflora.*

Inflorescence laxer with distinct pedicels.
Spines absent or present only on the young flowerless shoots, and then very small, not more than 2 cm. long; leaves usually spathulate-obovate; in variety *orbiculata* leaves more than 2 cm. long, more or less orbicular — 32. *angularis*, var. *orbiculata*.

Spines usually present, large and stout, borne on and below the flowering branches; leaves larger than in preceding, more or less obovate to oblanceolate, hardly spathulate.
Leaves fasciculate, more or less elliptic above the shortly narrowed base, about twice as long as broad, somewhat glaucous above; fruiting pedicel about 8–10 mm. long, slender..... — 33. *nemorosa*.
Leaves not fasciculate, more or less orbicular and slightly narrowed at the base, not broadest at the apex, more greenish than glaucous; fruiting pedicel short and stout..... — 34. *heterophylla*.
Leaves obovate or oblanceolate above the cuneate base, more than twice as long as broad, mostly glaucous; fruiting pedicels stouter, usually much less than 5 mm. long.
Leaves fasciculate, rather smallish, rarely more than 6 cm. long, green or greenish-glaucous..... — 35. *buxifolia*.
Leaves usually not fasciculate, rather large, usually well over 6 cm. long, grey, glaucous to whitish..... — 36. *senegalensis*.

1. G. capitata, Sim, Forests and Forest Flora, Cape Col. (1907), 186.

Celastrus capitatus, E. Mey. ex Sond. in Harv. and Sond. Fl. Cap. i. *458*; *Celastrus rigidus, Ecklon and Zeyher Enum. Plant. Afric. Austr.* (*1834–1837*) *947*, *p. 121*; *E. Mey. in Herb. Drège, name only.*

A glabrous rigid shrub, 3–6 feet high, exceedingly spiny. *Branches* terete, dark grey, striated and in parts slightly verrucose. *Twigs* very short. *Leaves* tufted, coriaceous, sub-sessile; lamina 1·2–5 cm. long, 0·3–1·1 cm. wide, obovate, rounded at the apex and emarginate, very cuneate at the base, with an entire margin and the veins showing only slightly on the under surface of the leaf. *Inflorescence* fasciculate, with the flowers in dense sub-sessile glomerules. *Flowers* 5-parted. *Sepals* 1·5 mm. long, deltoid, acuminate, with a deeply laciniated margin. *Petals* 2 mm. long, broadly oblong, with a ciliated margin. *Filaments* 3·5 mm. long, slightly broader at the base. *Disc* fleshy, deeply 5-lobed, with the filaments situated in the sinuses. *Ovary* 2-chambered, with 2 ovules in each chamber; style, 0·25 mm. long; stigma 3-lobed. *Fruit* a 3-locular triquetrous apiculate capsule 6 mm. long, with ligneous valves. *Seed* half-covered by a white aril.

Coast Region: Zoutpanshoogde near Zwartkopsrivier, Uitenhage, *Ecklon and Zeyher 947 in Herb. Kew.! and in Herb. Musei Austro. Afric.!* Redhouse near Port Elizabeth, *Patterson 2292 in Herb. Bolus!* Fish River, Bathurst Div. *Drège in Herb. Kew!* Albany, *Zeyher 848 in Herb. Kew!* Junction Farm, Gwatyn, Queenstown Div., *Galpin 8086 in Herb. Bolus!* and *in Herb. Galpin!* In scrub, Izeli, near Kingwilliamstown, *Galpin 5931 in Herb. Galpin!*; Kingwilliamstown, *Sim 1966 in Herb. Maritzburg Univ. Coll. 1672!* and *in Herb. Bolus!* Fish River, Kaffraria, *Baur 1090 in Herb. Kew!* and *in Herb. Bolus!* Komgha, *Flanagan 2585 in Herb. Musei Austro. Afric.!* and *in Herb. Bolus.*

Central Region : Somerset Div., *Burchell 3278 in Herb. Kew !* Graaff-Reinet, *Bowker in Herb. Kew !* Coega Kama Kloof at Bushmansriver Kloof, *Zeyher 2177 and 2178 in Herb. Musei Austro. Afric !*

Eastern Rerion : Butterworth, Transkei, *Pegler 2023 in Herb. Bolus !*

2. G. uniflora, sp. nov.

Frutices glabri, spinosi, erecti. *Rami* alli longii, teretes, striati, cano-fusci, alii brevissimi, folius fasciculatis. *Ramuli* sub-angulati. *Spinae* graciles, circa 1 cm. longae. *Folia* alterna vel fasciculata, coriacea ; petioli 1 mm. longi ; laminae lanceolatae, 1·5–4 cm. longae, 0·3–0·8 cm. latae, acutae, basi cuneatae ; margines serrati supra inedium ; nervis prominentibus. *Flores* axillares, 3–4-nati, 5-parti. *Sepala* 1 mm. longa, lato-oblonga, marginibus fimbriatis. *Petala* 2–5 mm. longa, sub-orbiculata, carnosa, marginibus integris. *Filamenta* 1 mm. longa, baso latiore. *Discus* carnosus sulcatus, margine depresso crenato. *Ovarium* 3-loculare ; stylus brevissimus, stigmate 3-lobo. *Ovula* in loculis 2, erecta. *Fructus* non vidi.

Eastern Region : Zwaartkop, Natal, *Medley Wood 10253 in Govt. Herb. Natal 11423 !* and *in Herb. Kew !* and *in Herb. Bolus !*

3. G. lucida, Loesen in Engler & Prantl Pflanzenfam. iii, V. 208.

Celastrus lucidus, Engler & Prantl Pflanzfam. iii. *V. 208* ; *Linn. Mant. 49 ; Murr. Syst. Veget. Ed. 13 (1774) 198 : Reich. Syst. Pl.* i. *(1779) 553 : Murr. Syst. Veget. (1784) 237 ; L. Hent. Thip : nov. 1 (1787)* 49, *tab. 25 ; Thunb. Prod. Cap. (1794) 42 ; Gmel, Syst. Veget. (1796) 406 ; Murr. Syst. Veget. edit. Pers. (1797) 248 ; Meerb. Icon. select (1798) tab. 12 ; Willd. Spec. I (1798) 1123 ; Thunb. in Rom. Arch. III (1805) 241. sp. 1 ; Ait. Hort. Kew. edit. 2a. II (1811) 25 ; Thunb. Fl. Cap. II (1818) 118 ; Rom. et Schult. Syst. Veget. V. (1819) 417 ; DC. Prod. II. (1825) 5 ; Sond. in Harv. and Sond. Fl. Cap.* i. *p. 456. Cassine concava, Lam. Dict. (1789) 652 ; Pers. Synops. 1 (1805) 327, sp. 5 ; Poiret Dict. Suppl. II (1811) 143 and tab. 130 fig. 2. Celastrus concavus, Lam. Illustr. Gen. No. 2695.*

A much-branched glabrous unarmed shrub, one or more feet high. *Branches* terete, greyish-brown. *Twigs* angular, striated. *Leaves* alternate, coriaceous ; petiole stout, 1–2 mm. long ; lamina 2 3 cm. long, 1–2 cm. wide, oval or more or less orbicular, obtuse and with a hooked mucro at the rounded apex ; rounded at the base, never cuneate, with an entire conspicuously revolute margin, and distinct venation. *Inflorescence* fasciculate ; fascicles few-flowered, with pedicels measuring 2–3 mm. and articulated just above the base. *Flowers* 5-parted. *Sepals* 1 mm. long, deltoid, with a laciniated margin. *Petals* 2·25 mm. long, broadly oblong, with an uneven margin and flecked with brown. *Filaments* 1·5 mm. long. *Disc* fleshy, forming a collar round the ovary, but not enveloping it, with five deep indentations in which the filaments are situated *Ovary* 2-4-chambered, mostly 3-chambered, with 2 ovules in each chamber ; stigmas 2-3, mostly 3, linear, sub-sessile. *Fruit* a 2-4-locular, mostly 3-locular, trigonous brown capsule, the size of a pea. *Seeds* angular, with a thin aril.

Coast Region : Howston, Caledon, *Marloth in Herb. Marloth 9206 !* Camp's Bay *Pappe in Herb. Musei Austro. Afric. ! Prior in Herb. Kew !* Bantry Bay near Sea Point, *Dawson in Herb. Bolus 13267 !* Table Mountain, *Masson in Herb. Kew !* Fish Hoek near Simonstown, *St. C. Caporn in Herb. Bolus 13266 !* Fish Hoek, *Page in Herb. Bolus 16019 !* Cape of Good Hope, *Herb. Forsyth in Herb. Kew !* Cape Agulhas, *Schlechter 10560 in Herb. Kew !* and *in Herb. Bolus !* and *in Nat. Herb. Pretoria !*

4. G. Zeyheri, Davison comb. nov. (Pl. XI, fig. 2.)

Celastrus Zeyheri, Sond. in Harv. and Sond. Fl. Cap., i. *456.*

A glabrous unarmed shrub 3–6 ft. high. *Branches* terete, greyish-brown. *Twigs* pale, greyish green, angular. *Leaves* alternate, coriaceous ; petiole stout, 1–2 mm. long ; lamina unequal ; the larger 2–2·5 cm. long and 1·4–1·8 cm. wide ; the smaller 0·5–1·2 cm. long, and 5–0·9 cm. wide ; obovate or rounded-obovate, obtuse or sub-acute, or

Plate XI.

1. *Cassine sphaerophylla*, O. Kuntze.
(No. 2171, Cape of Good Hope Herb.)

2. *Gymnosporia Zeyheri*, Davison.
(No. 576 Bolus, Cape of Good Hope Herb.)

emarginate, cuneate, with 3–4 coarse serrations on the upper half of the flat margin, sometimes entire, and then margin slightly revolute ; venation distinct. *Inflorescence* cymose, subsessile or very shortly pedunculate ; peduncle never exceeding 3 mm. *Flowers* 5-parted. *Sepals* 1 mm. long, orbicular, with a dark brown centre and pale transparent laciniated margin. *Petals* 1·75–2 mm. long, broadly oblong or sub-orbicular, with an uneven margin. *Filaments* 1 mm. long. *Disc* fleshy and saucer-like round the base of the ovary and with a crenate margin. *Ovary* 3-chambered with two ovules in each chamber ; style very short ; stigma indistinctly 3-lobed. *Fruit* a capsule the size of a small pea, globose-trigonous, with sub-membranous walls. *Seed* partly enveloped by a thin membranous aril.

Coast Region : Summit dolerite Kopje, Bowker's Park, Queenstown, *Galpin 2254 in Nat. Herb. Pretoria !* and *in Herb. Bolus !*

Central Region : Somerset, *Burchell 3071 in Herb. Kew !* near Middelburg, *Burchell 2808 in Herb. Kew !* in mountains near Graaff-Reinet, Cave Mt. *Bolus 576 in Herb. Kew !* and *in Herb. Bolus !* and *in Herb. Musei Austro. Afric. !* Graaff-Reinet, *Burchell 2854 in Herb. Kew !*

5. G. ilicina, Davison comb. nov.

Celastrus ilicinus, Burch. in Burchell's Trav. i. *340 ; DC. Prod.* ii, *7.*

A glabrous unarmed shrub with greyish-brown terete branches. *Twigs* angular, striated. *Leaves* alternate, coriaceous ; petiole 1–4 mm. long ; lamina 2–3·5 cm. long, 1 2·8 cm. wide, obovate or sub-orbicular, with an acute apex and distinctly cuneate base, dark green and veiny on the upper surface, glaucous beneath, with the margin coarsely repand-dentate, with 3-4 teeth on each side. *Inflorescence* fasciculate ; fascicles few-flowered with the pedicels articulated above the base and averaging 1 cm. in length. *Flowers* 5-parted. *Sepals* sub-orbicular ; 2 outer sepals 0·75 mm. long, with a brown deeply-laciniated margin ; 3 inner sepals 1 mm. long, with a slightly laciniated concolorous margin. *Petals* 2 mm. long, broadly oblong, with an uneven margin. *Filaments* 1 mm. long. *Disc* fleshy, saucer-like round the base of the ovary, with an undulate margin. *Ovary* 2–3-chambered, with 2 ovules in each chamber ; style 0·5 mm. long ; stigmas 2–3-lobed. *Fruit* a capsule.

Central Region : Bruintjes-Hoogte, Somerset East, *MacOwan 1235 in Herb. Musei Austro. Afric. !* and *in Herb. Bolus !*

Kalahari Region : Asbestos hills at Blaauwbosch Poort, Dist. Hay, *Wilman 1327 in Herb. Bolus !* and *in Nat. Herb. Pretoria !* Asbestos Hills ; *Marloth 4909 in Herb. Bolus ! Marloth 2076 in Herb. Marloth !* Asbestos Mountains, Griqualand West, *Burchell 1163 ! 2037 in Herb. Kew !*

6. G. undata, Szysz., Enum. Polypet.

Rehmann ii. *34 (1888) ; Sim in Forests and Forest Flora, Cape Col. (1907) 186 ; Pegler in Ann. Bolus. Herb.* ii. *13 (name only). Celastrus undatus, Thunb. Sond. in Harv. and Sond. Fl. Cap* i. *457 ; Celastrus collinus, Ecklon and Zeyher Enum. Plant. Afric. Austr. 931, p. 119 ; Celastrus dumetorum, Ecklon and Zeyher Enum. Plant. Afric. Austr. 932, p. 119 ; Celastrus ilicinus, Ecklon and Zeyher Enum. Plant. Afric. Austr. 933, p. 119 ; Celastrus cymatodes, Spreng. Syst. 175 ; Gymnosporia Zeyheri, Sond. in Harv. and Sond. Fl. Cap.* i, *456 ; Celastrus Zeyheri, Sond. in Harv. and Sond. Fl. Cap.* i, *456 ; Gymnosporia Zeyheri (Sond.) Loesen in Engl. Bot. Jahrb. 17 (1893) 548.*

A glabrous unarmed shrub or small tree. *Branches* terete, greyish-brown. *Twigs* angular, purplish-brown. *Leaves* alternate, thinly coriaceous ; petiole 2 5 mm. long ; lamina 3 7 cm. long (usually 3·5 4 cm. long), 1·5 4·5 cm. wide, obovate, obtuse or acute, with a distinctly cuneate unequal base ; upper surface darker in colour and both surfaces distinctly veined, with a slightly undulate coarsely serrated margin and with more than five teeth on each side of the margin. *Inflorescence* fasciculate, many-flowered. *Pedicels* at least 0·5 cm. long, articulated near the base. *Flowers* 5-parted. *Sepals* 0·75 mm. long, sub-orbicular, with a laciniated margin. *Petals* 2 mm. long, oblong, with

an uneven margin. *Filaments* 1·5 mm. long. *Disc* fleshy, collar-like, surrounding the base of the ovary but not enveloping it, with an undulate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 1 mm. long; stigmas 3. *Fruit* a 3-sided capsule 7 mm. long. *Seeds* with a thin yellow aril.

Sim, in "Forests and Forest Flora of Cape Colony," says of this plant: "Seldom over 20 feet in height and 12–15 inches diameter. Bark thin, dark, smooth, pinkish inside. Timber very little used, but close-grained, heavy, and even."

Pappe, who gives it the name Koko-tree, in speaking of its distribution, says: "It is frequent in the Eastern and Transkeian Conservancies and Natal, especially in the shale-formation scrubs; in high forest it is usually scarce. It abounds on the coast and even on the sea dunes, but also extends to 5,000 feet altitude."

Coast Region: Zwartkopsrivier, Uitenhage, *Ecklon and Zeyher 933 in Herb. Kew! Zeyher 2190 in Herb. Kew!* and *in Herb. Musei Austro. Afric!* Zoutpanshoogte, Uitenhage. *Ecklon and Zeyher 932 in Herb. Musei Austro. Afric!* Quaggas-Vlakte, Uitenhage, *Ecklon and Zeyher 931 in Herb. Musei Austro. Afric!* Uitenhage: *Zeyher 855 in Herb. Kew! Prior in Herb. Kew!* Bosjeman's River (Albany) *Zeyher 2185 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Albany, *Prior in Herb. Kew!* Wooded Ravines, Junction Farm, Gwatyn, Queenstown Dist. *Galpin 8088 in Nat. Herb. Pretoria!* First Creek, East London, *Galpin 3162 in Nat. Herb. Pretoria!* Woods near Kei Mouth, *Flanagan 877 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Africa!* and in *Herb. Bolus!*

Kalahari Region: Houtbosch, Transvaal, *Rehmann*, 6516 *in Herb. Kew!* and *in Herb. Bolus!*

Eastern Region: Natal and Zululand, *Gerrard 1589, 1590 in Herb. Kew!* Kaakloof, *Wylie 61* and *in Govt. Herb. Natal 7757!* Avoca, near Durban, *Schlechter 2876 in Herb. Bolus!* No locality. *Prior in Herb. Kew!*

7. G. procumbens, Loesen. in Engl. Jahrb., 39 (1906) 169.

Pegler in Ann. Bolus Herb. ii, *13* (*name only*). *Celastrus procumbens, Linn. f. Suppl. 153; Sond. in Harv. and Sond. Fl. Cap. 1, 457; Ecklon and Zeyher Plant. Afric. Austr.* (*1834-1837*) *934, p. 119; DC. Prod. II. 7; Celastrus ilicinus, pl. Krauss ex Sond. l.c. name only; Cassine articulata, E. Mey. ex Sond. l.c. name only.*

A glabrous procumbent unarmed shrub ranging from 1–10 feet in height. *Branches* terete, brownish-grey. *Twigs* angular. *Leaves* alternate, coriaceous; petiole 1–3 mm. long; laminae 3–6 cm. long (some under 3 cm. but the majority longer than 3 cm.), 1·5–3·5 cm. wide, ovate or elliptic, acute, with a minute recurved point, cuneate, with 3–5 spinous serrations on each side of the leaf, paler beneath, shiny above, with a strongly recurved margin and with distinct venation showing about 4 lateral veins on each side. *Inflorescence* fasciculate, many-flowered. *Pedicels* 0·5–1 cm. long, articulated well above the base or near the middle. *Flowers* 5-parted. *Sepals* orbicular; 2 outer sepals, 1 mm. long, brown-edged, deeply laciniated; 3 inner sepals 1·5 mm. long, with a concolorous slightly laciniated margin. *Petals* 2·5 mm. long, broadly oblong, with an irregular margin. *Filaments* 1 mm. long. *Disc* fleshy, collar-like, 5-sided. *Ovary* 3-chambered; stigma sub-sessile, obsoletely 3-lobed. *Fruit* a woody 3-locular capsule, the size of a pea.

This is a low-growing procumbent shrub found growing among shrubs along the sea-shore and on the sand dunes.

Coast Region: Western escarpment of Bokkeveld, *Marloth in Herb. Marloth 7921!* Stilte Bay, Riversdale Dist., *Muir 447* and *in Herb. Galpin 5275!* Melville, Knysna, *Burchell 5545 in Herb. Kew!* Knysna, *Duthie 591 in Herb. Bolus!* Sand dunes, Groot River, Zitzikama, *Fourcade 665 and 1241 in Herb. Fourcade!* Uitenhage, *Pappe in Herb. Musei Austro. Afric.!* Port Alfred, *Potts in Grey Univ. Coll. Herb. 229!* Port Elizabeth, *Paterson 2294 in Herb. Bolus! Ecklon and Zeyher 934 in Herb. Musei Austro. Afric.!* Algoa Bay, *Burchell 4374 in Herb. Kew!* Kowie, Bathurst Div. *Tyson in Herb. Bolus!* and *in Nat. Herb. Pretoria!* Rietfontein, Bathurst Div. *Burchell 4057 in Herb. Kew!* Bosjeman's River Hoogde (Albany) *Zeyher 2205 in Herb. Musei Austro. Afric.!* Margins of woods

on sand hills, East London, *Galpin 5686 in Nat. Herb. Pretoria!* Sea Coast, East London' *Galpin 1846 in Herb. Bolus! and in Nat. Herb. Pretoria!* Sand dunes behind the Orient Beach, East London, *Kotze in Herb. Forest Dept. No. 3382* and *in Nat. Herb. Pretoria!* In valley next beyond Naboom River Mouth, East London, *Galpin 7785 in Nat. Herb. Pretoria!* Naboom Mouth, *Murray in Herb. Musei Austro. Afric.!* In Krantz near Naboom River Mouth, East London, *Galpin 7769 in Nat. Herb. Pretoria!* East London: *Sim 2197 in Herb. Maritzburg Univ. Coll. 1671!* and *in Herb. Bolus! Sim 1971* and *in Herb. Maritzburg Univ. Coll. 1663!* Among shrubs near Kei Mouth, *Flanagan 166 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric.!* Kentani, *Pegler 842 in Herb. Bolus!*

Eastern Region: Isipingo, Natal, *Van der Bijl in Govt. Herb. Natal. 16084!* Between Umkomaas and Umlaas Rivers, Natal, *Drège in Herb. Kew!* Winkle Spruit, Natal, *Govt. Herb! Wood 11895 in Nat. Herb. Pretoria! Franks in Govt. Herb. Natal 12977!* Durban: *Wood 6358 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* and *in Herb. Bolus!* and *in Nat. Herb. Pretoria! Wood in Nat. Herb. Pretoria! Wood 8555 in Herb. Musei Austro. Afric.! Wood 10984* and *in Govt. Herb. Natal, 12058! and in Herb. Musei Austro. Afric. 7366! Rehmann 8995 in Herb. Bolus!* and *in Herb. Kew!* Bluff near Durban, *Wood 11187 in Herb. Bolus!* Port Natal, *Gueinzius in Herb. Kew!* Inanda, Natal, *Wood 1630* and *in Govt. Herb. Natal 77*, and *in Herb. Bolus!* and *in Herb. Kew!* Natal: *Sanderson in Herb. Kew! Gerrard 1369! 1374 in Herb. Kew! Cooper 1260 in Herb. Bolus!* and *in Herb. Kew!* Zululand, *Cooper 2162 in Herb. Kew!*

8. G. Peglerae, Davison, sp. nov.

Arbores parvi, glabri, circa 15 pedes alti. *Rami* teretes, cano-fusci. *Ramuli* angulati. *Folia* alterna, coriacea; petioli 1 cm. longi; laminae 5–7 cm. longae, 2–3 cm. latae, oblongo-ovatae, acuminatae, acutae, cuneatae, marginibus crassis serratis planis; non-nulli nervi laterali, supra prominenti. *Inflorescentia* fasciculata, 4–6-floribus. *Pedicelli* 0·5–0·8 cm. longi, leviter infra articulati. *Flores* 5-parti. *Sepala* 1·5 mm. longa, membranaciis marginibus crassis laciniatis. *Petala* 2–5 mm. longa, oblonga, marginibus undulatis. *Filamenta* 1·5 mm. longa. *Discus* carnosus, annulus. *Ovarium* 3-loculare: ovula in loculis 2, erecta; stylus 0·5 mm. longus; stigmata 3, 0·5 mm. longa. *Fructus* capsularis 3-valvatus, 0·6 mm. longus.

Eastern Region: Forests, Kentani, *Pegler 1209 in Nat. Herb. Pretoria!* (Type!) and *in Herb. Musei Austro. Afric!*

9. G. fasciculata, Loesen. in Eng. Jahr., 19 (1894), 232.

Catha fasciculata, Tul. in Ann. Sc. Nat. 4 ser. VIII. 98.

A glabrous unarmed tree, reaching a height of 15 feet. *Branches* terete, greyish-brown. *Twigs* angular. *Leaves* alternate, coriaceous; petiole 0·3–1 cm. long: lamina 4·5–9·5 cm. long, 1·2–4 cm. wide, lanceolate, sometimes lanceolate-ovate, acuminate, acute, cuneate, with a serrate margin not or only very slightly recurved and with distinct venation showing several lateral nerves. *Inflorescence* fasciculate, many-flowered. *Pedicels* 0·3–0·7 cm. long, articulated above the base, but more towards the base than the middle of the pedicel. *Flowers* 5-parted. *Sepals* 1 mm. long, sub-orbicular, with a deeply laciniated margin. *Petals* 2·5 mm. long, oblong, with a very irregular margin. *Filaments* 1·5 mm. long. *Disc* fleshy, saucer-like round the base of the ovary and with an undulate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 1 mm. long; stigmas 3. *Fruit* a 3-locular capsule.

Coast Region: Kingwilliamstown, *Sim in Herb. Maritzburg Univ. Coll. 1673!*

Kalahari Region: Hillside, Louws' Creek, near Barberton, *Galpin 890 in Herb. Kew!* and *in Herb. Bolus!* and *in Herb. Musei Austro. Afric.!* and *in Nat. Herb. Pretoria!* and *in Govt. Herb. Natal 7208!*

Eastern Region: Natal and Zululand, *Gerrard 1370 in Herb. Kew!* Umzinyati Falls, *Wood 1312 in Col. Herb. Natal 5738!* and in *Herb. Musei Austro. Afric.!* near Durban. *Wood 10983 in Govt. Herb. Natal 12064!* and *in Natal Herb. Pretoria!* Camperdown, *Franks in Govt. Herb. Natal 13614!*

Without Locality: *G. McKen 1370 in Govt. Herb. Natal, 16958!*

10. G. albata, Sim Forest and Forest Flora Cap. Col. 186 (1907).

Celastrus albatus, N. E. Br. in Kew Bull. (1906). 16.

A glabrous unarmed shrub or small tree, reaching a height of 15 feet. *Branches* terete, greyish-brown. *Twigs* sub-terete, ashy. *Leaves* alternate, coriaceous; petiole 0·2 0·5 cm. long; lamina 3·5 8 cm long, always under 10 cm. long, 2-5 cm. wide, elliptic or obovate, obtuse or acute, cuneate, denticulate, green above, white beneath, with the veins showing distinctly on both surfaces. *Inflorescence* fasciculate, many-flowered. *Pedicels* averaging 5 mm. long, not exceeding 1 cm. in length, articulated more towards the middle than the base of the pedicel. *Flowers* 5-parted. *Sepals* 0·75 mm. long, deltoid, with a deeply laciniated brown-edged margin. *Petals* 2·5 3 mm. long, elliptic, with an irregular undulate margin. *Filaments* 2 mm. long. *Disc* fleshy, saucer-like round the base of the ovary and with a crenulate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 0·5 mm. long; stigmas 3, small. *Fruit* a 3-locular obovate capsule, 6 mm. long.

Coast Regions. -Mountain Ravines, Queenstown, *Galpin 1576 in Nat. Herb. Pretoria!* Queenstown, *Potts in Grey Univ. Coll. Herb. No. 1875* and *in Herb. Bolus!* Fort Cunynghame, Kaffraria, *Sim 2115 in Nat. Herb. Pretoria!*

Central Region: In wooded kloof, Pot River Berg, Maclear Dist. *Galpin 6597 in Herb. Kew!* and *Nat. Herb. Pretoria!*

Kalahari Region: Leribe, Basutoland. *Dieterlen 285 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric. 7271!* Pyramid Estate near Potgieters Rust, *Galpin 8805 in Herb. Musei Austro. Afric.!*

Eastern Region: Edge of wood near Van Reenen's Pass, *Wood 6362 in Govt. Herb. Natal 8531! and in Nat. Herb. Pretoria!* and in *Herb. Musei Austro. Afric.! and in Herb. Bolus!* and *in Herb. Kew!* Indeni, Zululand, *Davis No. 27, Herb. Wood No 7888, in Herb Musei Austro. Afric.!* and *in Herb. Bolus!* and *in Herb. Kew! Davis 27 in Govt. Herb. Natal. 8530!*

11. G. deflexa, Sprague in Kew Bull. (1906), 246.

A glabrous unarmed medium-sized or large tree. *Branches* glabrous, terete, slightly flexuous, with a greyish-brown wrinkled bark. *Twigs* sub-terete, pallid, glaucous-green. *Leaves* alternate, thinly coriaceous; petiole about 1 cm. long, grooved above; lamina 10 15 cm. long, 3·5 6 cm. wide, lanceolate-ovate or obovate, obtuse, with a cuneate base and serrato-dentate margin, glaucous-green above, with prominent closely-reticulated venation, whitish-glaucous beneath, with the midrib and 10 11 lateral veins more prominent than on the upper surface, but the veins less distinct than on the upper surface. *Inflorescence* fasciculate, with 10 20 flowers in each fascicle. *Pedicels* 1·5 2 cm. long, conspicuously articulated 5 6 mm. above the base. *Flowers* 5-parted. *Sepals* deflexed, 1 1·75 mm. long and 1 1·25 mm. wide, ovate-oblong with a brown-edged laciniated margin at the apex or as far as the middle of the sepal. *Petals* deflexed, 4·75 5 mm. long, 3 mm. wide, elliptic-ovate or sub-orbicular with an inflexed apex and irregular margin. *Filaments* 1·5 mm. long; anthers sub-orbicular. *Disc* fleshy, annular, with an irregular margin. *Ovary* 3-chambered, with two ovules in each chamber; style 0·5 0·75 mm. long; stigmas 3. *Fruit* a 3-locular depressed trigonous-globose capsule, with sub-ligneous valves. *Seeds* with an incomplete membranous aril.

Coast Region: In woods near Fort Cunynghame, *Bolus in Herb. Bolus 8825!* in woods, Kentani, *Pegler 2113 in Herb. Bolus!*

Kalahari Region: Woodbush, Pietersburg Dist. *Grenfel 4 in Herb. Kew! Grenfel in Transv. Col. Herb. 1142!* and in *Herb. Kew!* Potatabosch No. 2013 near stream, Pietersburg Dist. *Burtt-Davy 5077 in Transv. Col. Herb. 1158!* and *in Herb. Kew!* and in *Herb. Bolus!* Potatabosch, Pietersburg Dist. *Eastwood in Transv. Col. Herb. 1294!* Forest at Hangklip: *Legat 67 in Transv. Col. Herb. No. 4923! in Herb. Kew! Legat 68 in Transv. Col. Herb. No. 4924! in Herb. Kew!* Houtboschberg, *Burtt-Davy 1242 in Herb. Bolus!*

Sprague says of this plant: "According to Burtt-Davy, *G. deflexa* is common in the mist-belt forest of the Houtboschberg (Zoutpansberg District) at altitudes of between 1,400 and 1,500 metres. It is there known as "Saffraan-hout," on account of the yellow colour of the inner bark."

12. G. cordata, Sim. Forests and Forest Flora Cape Col. 184 (1907).

Celastrus cordatus E. Mey. ex Sond. in Harv. and Sond. Fl. Cap. i. 454.

A glabrous unarmed shrub or tree. *Branches* terete, brownish. *Twigs* purplish-brown, angular, slightly flexuous. *Leaves* alternate, membranous or sub-coriaceous, sessile or sub-sessile; lamina 3·5 6·8 cm. long, 1·5–4 cm. wide, ovate, with a distinctly cordate base and an acute or obtuse very shortly mucronulate apex; margin serrulate or sub-entire; paler beneath, with the veins showing distinctly on both surfaces. *Inflorescence* axillary, cymose, very few-flowered. *Peduncle* 2 4 mm. long; pedicel about 5 mm. long. *Flowers* 5-parted. *Sepals* 1·5 mm. long, sub-orbicular, with an irregular or very slightly laciniated margin. *Petals* 2·75 mm. long, sub-orbicular, narrowed to a short claw and with a slightly involute margin and distinct yellowish-brown veins. *Filaments* 1 mm. long. *Disc* fleshy, flat, 5-angled. *Ovary* 3-chambered, with two ovules in each chamber; style 5 mm. long; stigmas 3. *Fruit* an obcordate 3-locular capsule, about 1 cm. long. *Seeds* compressed, covered by a thin membranous aril.

Coast Region: Along streams in woods, near Kei Mouth, *Flanagan 847 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric.!* Kentani, *Peyler 2108 in Herb. Bolus!*

Eastern Region: Egossa, E. Pondoland, *Sim 2471 in Nat. Herb. Pretoria!* and *in Herb. Bolus!* Umzimkulu, Natal, *Drège in Herb. Kew!* Sydenham near Durban, *Wood 8257 in Herb. Kew!* Dumisa station, Alexandra Dist. *Rudatis 1432 in Herb. Kew!* Natal, *Gerrard 1376 in Herb. Kew!*

13. G. monococca, Davison, sp. nov. (Pl. XVI.)

Arbores parvi vel frutices, 10–13 pedes alti, inermes, glabri, erecti. *Rami* teretes, cano-fusci, striati. *Ramuli* angulati, striati. *Folia* alterna, coriacea; petioli 2 3 mm. longi; laminae 3·5–5·3 cm. longae, 0·5–1 cm. latae, lanceolato-linearіae, obtusae, mucronatae, cuneatae, rugosae, margines integri leviter reflexi; costa infra prominenta. *Inflorescentia* cymosa, floribus paucis. *Pedunculi* 2 2·5 cm. longi. *Flores* minimi, 5-parti, immaturi. *Fructus* capsularis circa 0·7 cm. longus, 1-locularis. *Semina* arilo membranaceo.

Coast Region: Buffeljagdsriver, Swellendam, *Zeyher 1652 in Herb. Musei Austro. Afric.!* Breede River, *Burchell 7509! 7525! 7477 in Herb. Kew!*

14. G. angustifolia, Bolus and Wolley-Dod in Trans. S. Afr. Phil. Soc. xiv, 247.

Scytophyllum angustifolium, Sond. in Harv. and Sond. Fl. Cap. i. 472. Elaeodendron angustifolium, Presl. Bot. Bem. 34.

A glabrous unarmed shrub. *Branches* terete, brownish, of one kind, long, with scattered leaves. *Twigs* angular, striated, greyish-green. *Leaves* alternate, coriaceous; petiole about 3 mm. long; lamina 3 4·5 cm. long, 0·8 1·5 cm. wide, lanceolate, obtuse, with a small inflexed point, cuneate, with an entire margin slightly rugose on the upper surface and with obsolete venation. *Inflorescence* a few-flowered axillary cyme. *Peduncle* 3–5 mm. long. *Pedicels* extremely short. *Flowers* 5-parted. *Sepals* 1 mm. long, sub-orbicular, flecked with brown and with a ciliated margin. *Petals* 1·5 mm. long, oblong, flecked with brown,

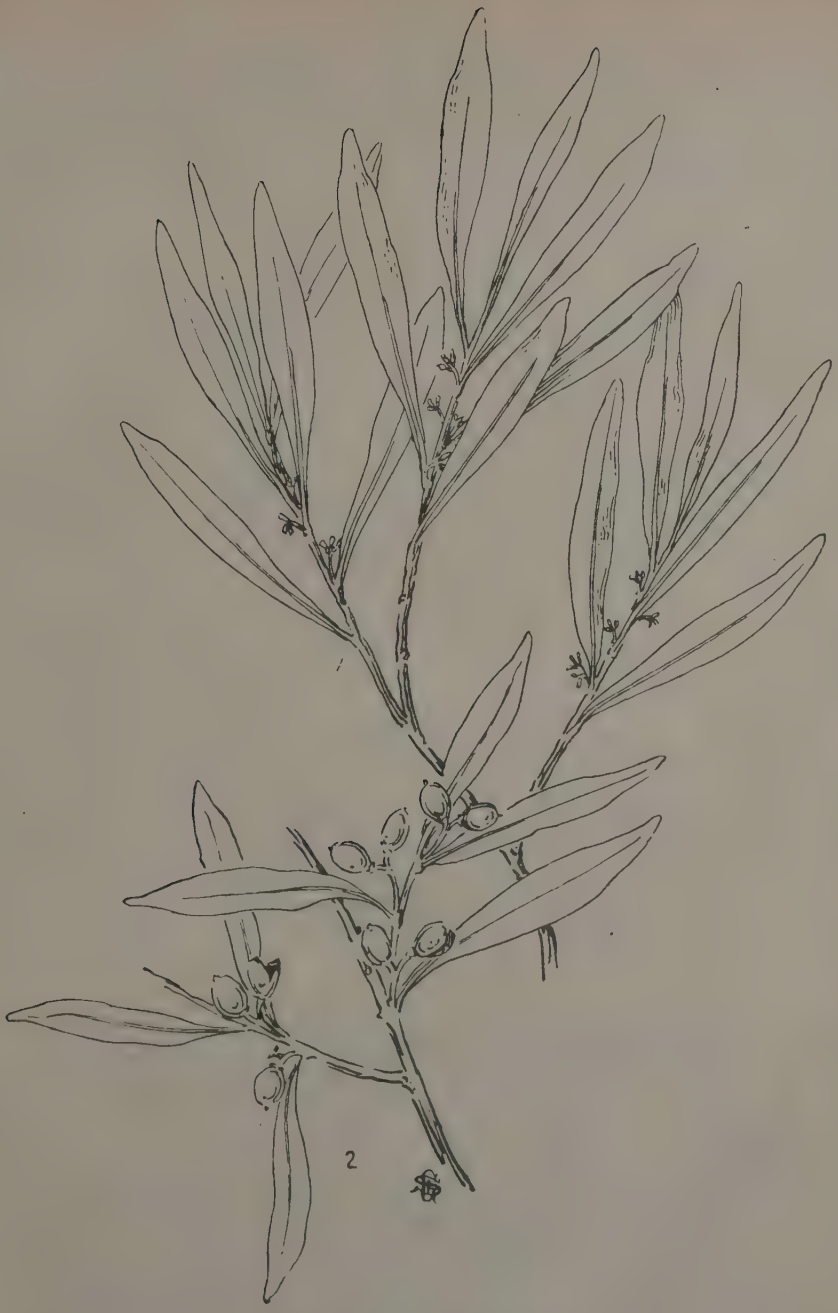

Plate XVI.

Gymnosporia monococca, Davison.
(No. 7477, Herb. Hort. Bot. Reg. Kew.)

and with a ciliated somewhat undulate margin. *Filaments* 0·5 mm. long. *Disc* fleshy, collar-like round the base of the ovary, and with a crenulate margin. *Ovary* 2–3-chambered, with 2 ovules in each chamber; style extremely short; stigmas 2–3. *Fruit* not seen.

Coast Region: Devil's Peak near Capetown, *Pappe in Herb. Musei Austro. Afric.!* Table Mountain, *L. Bolus in Herb. Bolus 16108!* Rocky ridge N.E. of head of Kasteel's Poort, Table Mountain, *Pillans in Herb. Bolus!*

No Locality: *Drège in Herb. Kew!*

15. G. polyacantha, Szysz. Enum. Polypet. Rehm. 2 : 34 (1888).

Celastrus polyacanthus, Sond. in Harv. Fl. Cap. i. 455; Celastrus linearis, Ecklon and Zeyher Enum. Plant. Afric. Austro. 946, p. 121 name only; Polyacanthus angustifolius, Presl. Bot. Bem. 33. Celastrus inflexus, Ecklon and Zeyher, Enum. Plant. Afric. Austro. 956 name only.

A greyish rigid glabrous shrub bearing strong spines. *Branches* of two kinds: the long ones greyish-brown, terete, curved, straight or inflexed, verrucose; the short ones very much abbreviated, growing in the axils of the spines, scarred by the previous leaves and bearing this year's leaves in a tuft at the apex. *Spines* large, up to 9 cm. long. *Leaves* tufted, membranaceous or very thinly coriaceous; petiole 1–3 mm. long; lamina 1–3 cm. long, 0·2–0·8 cm. wide, oblanceolate or linear-oblanceolate, obtuse or emarginate, distinctly cuneate, with conspicuous veins and an entire or slightly serrate margin. *Inflorescence* compact, shorter than the leaves. *Peduncle* never exceeding 6 mm. *Pedicels* 1–1·5 mm. long. *Flowers* 5-parted. *Sepals* 0·75 mm. long, sub-orbicular, with a ciliated margin. *Petals* 1·75–2 mm. long, oblong, with an uneven somewhat undulate margin. *Filaments* 1–1·75 mm. long. *Disc* fleshy, annular, with a crenate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 0·25 mm. long; stigmas obsoletely 3-lobed. *Fruit* a dry 3-locular capsule, 4 mm. long. *Seeds* with an incomplete yellow membranous aril.

Coast Region: Despatch, Uitenhage, *Holland 34 in Herb. Bolus!* Karroo-like hills near Zwartkop River, Uitenhage, *Zeyher 956 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* and in *Herb. Bolus!* Zwartkop's Rivier, Uitenhage, *Ecklon and Zeyher 946 in Herb. Kew!* and *in Herb. Musei. Austro. Afric!* Zwartkop, Uitenhage, *Ecklon and Zeyher ? in Herb. Musei Austro. Afric.!* Redhouse, near Port Elizabeth, *Paterson 1079 and in Herb. Bolus!* Sea coast, East London, *Page 16983 in Herb. Bolus!*

Central Region: Cookhouse, Somerset East, *Rogers 2762 in Herb. Bolus!* Great Fish River, Somerset Div. *Burchell 3258 in Herb. Kew!* Kommadakka, Somerset Div. *Burchell 3316 in Herb. Kew!* near Mortimer, Cradock, *Kensit in Herb. Bolus!* Between Kruidfontein and Karnmelk River, Graaff-Reinet Div. *Burchell 2942, in Herb. Kew!* Culmstock, Middelburg Dist., *Southey in Herb. Galpin 5868!* and *in Herb. Kew!*

Kalahari Region: near Bloemfontein, *Grey Coll. Herb. 55 in Herb. Bolus!* and *in Herb. Kew!* and *in Nat. Herb. Pretoria!* Braamfontein, Johannesburg, *Gilfillan 6198 in Nat. Herb.* Pretoria! Muckleneuk, near Pretoria, *Stent in Govt. Herb. 15114!* Pretoria Koppjes, *Leendertz 162 in Herb. Bolus!* Irene, near Pretoria, *Conservator of Forests, in Col. Herb. 9216!* Road from Pretoria to Crocodile River, *Burtt-Davy 184 in Nat. Herb. Pretoria!*

16. G. integrifolia, Glover in Ann. S. Afr. Mus. 9 (1915). 206.

Celastrus integrifolius, Linn. f. Sond. in Harv. and Sond. Fl. Cap. i. 457; Thunb. in Fl. Cap. 219; Ecklon and Zeyher Enum. Plant. Afric. Austro. (1834–1837) 936, p. 119.

A rigid glabrous shrub. *Branches* of two kinds; the long ones terete, greyish-brown, rigid, flexuous, verrucose; the short ones very much abbreviated, bearing the scars of previous leaves below, and the present year's leaves and inflorescence in a tuft at the apex and growing in the axils of the spines or on the spines. *Spines* very strong, reaching a length of 9 cm. and bearing abbreviated branches. *Leaves* tufted, in the axils of the spines or on the spines, coriaceous; petiole 1–2 mm. long; lamina 1–1·5 cm. long, 0·3–0·7 cm. wide, obovate-cuneate, obtuse or emarginate, with an entire reflexed margin and mostly obsolete

venation, although in some cases, e.g. *Galpin* 5068, the veins are quite distinct on both surfaces. *Inflorescence* cymose, lax, borne on the abbreviated branches. *Peduncle* 1 cm. or more long. *Pedicels* 4–5 mm. long. *Flowers* 5-parted. *Sepals* 1·25 mm. long, suborbicular, with a ciliated margin. *Petals* 2·5–3 mm. long, 1·2–2 mm. wide, ovate-oblong, fleshy, with a ciliated incurved margin and distinct central vein on the ventral face. *Filaments* 1·25–1·5 mm. long; anthers oblong. *Disc* fleshy, flat, obsoletely 5-lobed and with a slightly undulate margin. *Ovary* 3-chambered with two ovules in each chamber; style 0·5 mm. long; stigma obsoletely 3-lobed. *Fruit* a 3-locular dry triquetrous capsule 4–5 mm. long. *Seeds* with an incomplete yellow membranous aril.

Coast Region: Wilgerboschfontein, Roggeveld, *Worsdell in Herb. Musei Austro. Afric. 6100!* Between Kochmanskloof and Gauritz River, Kannaland (Swellendam) *Ecklon and Zeyher 936 in Herb. Musei Austro. Afric.!* Corenti River Farm, Dist. Riversdale, *Muir 49 in Herb. Galpin 5068!* Uitenhage; *Thorn 15 in Herb. Kew! Alexander Prior in Herb. Kew!* Albany, *Bowker in Herb. Kew!* Bothasberg, *MacOwan 1134 in Herb. Kew!* Dist. of Beaufort *Cooper 520 in Herb. Kew!*

Central Region: Somerset; *Atherstone 91 in Herb. Kew! Burchell 3321 in Herb. Kew!* in Karroo near Kockman's Kloof, *Mund in Herb. Kew!* near Graaff-Reinet, *Bolus 135 in Herb. Kew!* Sunday's River, Graaff-Reinet Div.: *Burchell 2883! 2872 in Herb. Kew!* Camdeboosberg, Aberdeen Div. *Drège in Herb. Kew!*

Western Region: Olifants River, *Zeyher in Herb. Musei Austro. Afric.!* Between Bitterfontein and Stinkfontein, Namaqualand, *Pearson 5535 in Herb. Bolus!*

17. G. saxatalis, Davison comb. nov. (Pt. XII, Fig. 1.)

Celastrus saxatalis, Burch., Burchell's Trav. II, 264.

Fructi spinosi, glabri; ramis pluribus. *Spinosi* tenuii, 1–1·5 cm. longi. *Rami* alii longi, teretes, cano-fusci; alii brevissimi, foliis fasciculatis inflorescentibusque. *Folia* fasciculata, coriacea; petioli 0·5 mm. longi; laminae 0·6–1·5 cm. longae, 0·2–0·4 cm. latae, obovatae, integrae, cuneatae, apicibus rotundis vel sub-emarginatis; nervae supra inconspicuae, costa infra prominenta. *Inflorescentia* cyma; floribus paucis. *Pedunculi* 1 cm. longi. *Pediceli* 0·5–0·7 cm. longi, filiformi. *Flores* 5-parti. *Sepala* 1 mm. longa, marginibus leviter laciniatis. *Petala* 4 mm. longa, oblonga, marginibus integris recurvis. *Filamenta* 2·5 mm. longa. *Discus* carnosus, annulus. *Ovarium* 4-loculare; ovula in loculis 2; stylus 1·5 mm. longus; stigmata leviter 4-lobata. *Fructus* von vidi.

Kalahara Region: Asbestos mountains, Griqualand West: *Burchell 1671! 2027 in Herb. Kew!* Griqualand West *Burchell 2158 in Herb. Kew!* near Hamapery, Bechuanaland. *Burchell 2487 in Herb. Kew!*

18. G. vaccinifolia, Conrath in Kew Bull. (1908) 221.

A divaricate shrub reaching a height of 3·5 m. and armed with slender spines. *Branches* of two kinds: the long ones terete, dark-grey; the short ones very abbreviated, bearing the scars of former leaves and this year's leaves and inflorescence at the apex. *Spines*, when present, very small and slender, straight or curved. *Leaves* tufted, coriaceous: petiole very short; lamina 5–12 mm. long, 2–3·5 mm. wide, oblong or obovate-oblong, with a rounded or sub-emarginate apex and a cuneate base, entire, with prominent venation on both surfaces. *Inflorescence* a few-flowered cyme, a little longer than the leaves. *Peduncle* about 0·5 cm. long. *Pedicels* 1·5–4 mm. long, filiform. *Flowers* 5-parted, never exceeding 2 mm. in length. *Sepals* 0·5 mm. long, ovate and rounded at the apex. *Petals* 1·5 mm. long, ovate-oblong. *Fruit* a 3-locular, dry reddish-coloured capsule.

A full description of the flower cannot be given, owing to lack of material.

Central Region: In the bush near Modderfontein. *Conrath 88 in Herb. Kew!*

Western Region: Naukleft Mts. between Goas and Kabiras, on stony ground, *Pearson 9072 in Herb. Bolus!*

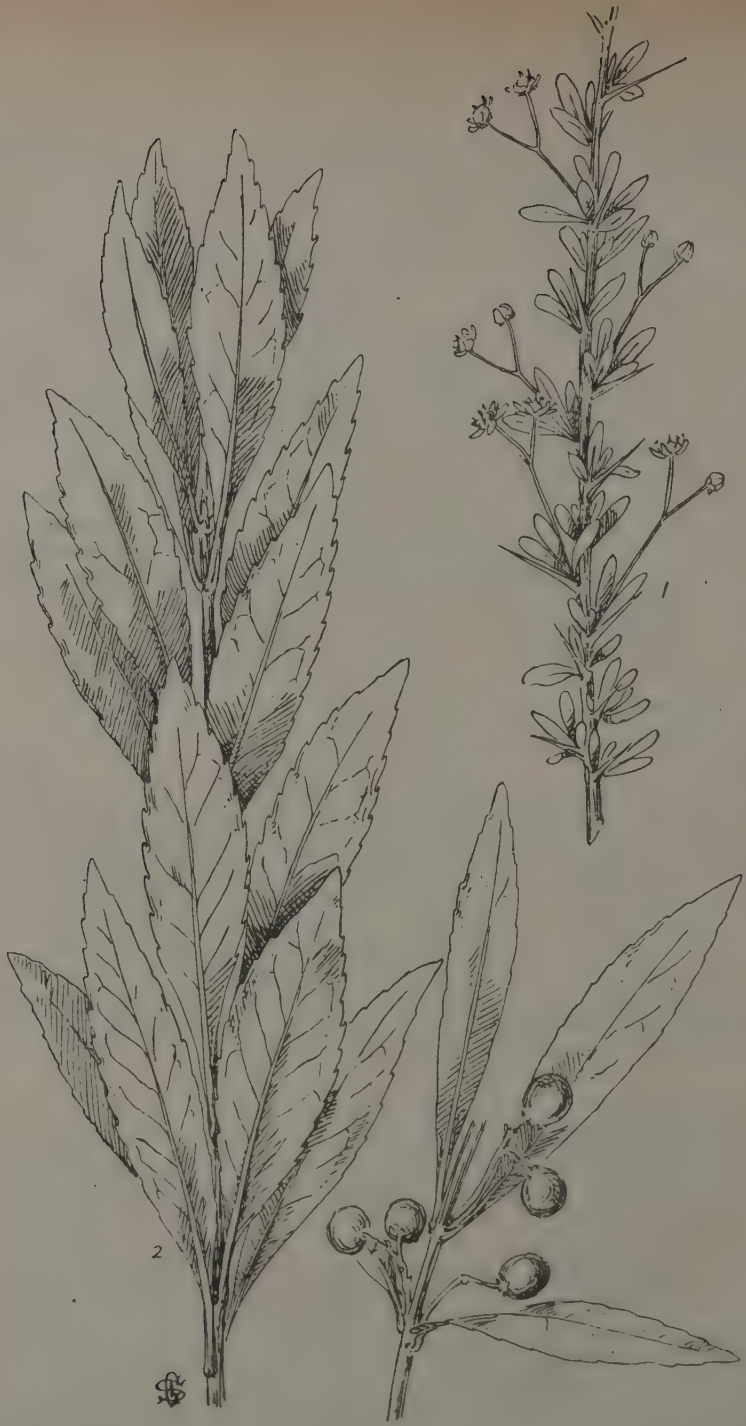

Plate XII.

1. *Gymnosporia saxatalis*, Davison.
(Burchell 2027.)

2. *Hartogia capensis*, Thunb.

19. G. condensata, Sprague in Kew Bull. (1906), 246.

A small glabrous spiny tree. *Branches* of two kinds: the long ones sub-terete, pallid, glaucous-green, with internodes 0·7–2 cm. long; the short ones very abbreviated in the axils of the spines or on the spines and bearing this year's leaves and inflorescence at the apex. *Spines* very strong. *Leaves* in tufts above the spines, chartaceous; petiole 2–3 mm. long, grooved above; lamina 1·5–2·5 cm. long, 6–8 mm. wide, oblanceolate or narrowly obovate, obtuse or somewhat emarginate, very often mucronulate, gradually narrowed towards the base, distinctly minutely glanduloso-serrate, pallid glaucous-green on both sides, with the veins obscure above but prominent beneath. *Inflorescence* a very densely-glomerated cyme with numerous flowers, borne on the spiny branches. *Flowers* 5-parted. *Pedicels* 3–3·5 mm. long. *Sepals* 1–1·5 mm. long, sub-orbicular, sub-membranous, slightly concave above and with an irregularly laciniated margin. *Petals* 2·75–3·5 mm. long, 1·75–2·5 mm. wide, elliptic or ovate-elliptic, finally patent or slightly deflexed, and with a minutely denticulated margin. *Filaments* 1·75–2·25 mm. long, broader at the base. *Disc* fleshy, annular. *Ovary* 3-chambered with two ovules in each chamber, 0·75 mm. high; style very short; stigmas 3, about 0·5 mm. long.

Kalahari Region: Olifants River, Middelburg Dist. *F. A. Hurley!*

20. G. linearis, Loesen. in Engl. & Prantl Nat. Pflanzfam iii. 5.

Celastrus linearis, Linn. f. Sond. in Harv. and Sond. Fl. Cap. i. 455; Thunb. Fl. Cap. 219; Celastrus stenophyllus, Ecklon and Zeyher Enum. Plant. Afric. Austro. (1834–1837) 955, p. 122; Eucentrus linearis, Presl. Bot. Bem. 33; Polyacanthus stenophyllus, Presl. l.c.

A glabrous greyish-glaucous, spiny shrub. *Branches* usually long, terete, greyish-brown, but some abbreviated and bearing tufts of leaves. *Twigs* sub-angular. *Spines* horizontal, 4–5 cm. long, bearing leaves and inflorescences. *Leaves* alternate, coriaceous; petiole 2–3 mm. long; lamina 2·5–9 cm. long, 2–7 mm. wide, linear or lanceolate, acute or obtuse, with a narrowed base, glaucous-green, one-nerved, with a distantly but distinctly toothed margin. *Inflorescence* lax, cymose, axillary, several-flowered. *Peduncle* 1–6 mm. long. *Pedicels* 1–2 mm. long, lengthening in fruit. *Flowers* 5-parted. *Sepals* 0·5 mm. long, deltoid, with a ciliated margin. *Petals* 2 mm. long, closely flecked with brown, oblong, or oblong-ovate, with a ciliated margin from the apex to half-way down the petal. *Filaments* 1·25 mm. long. *Disc* flat, fleshy, saucer-like, with a crenulated margin. *Ovary* 2–3-chambered, with 2 ovules in each chamber; style 0·25 mm. long; stigma shortly 2–3 lobed. *Fruit* usually a 2-locular dry capsule. *Seed* with an incomplete membranous aril.

Coast Region: Uitenhage: *Prior in Herb. Kew! Ecklon and Zeyher 955 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Koegakammas Kloof, *Ecklon and Zeyher 159 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Commando Kraal, Sunday's River, *Zeyher 303 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Bushman's River Station, *Galpin 2979 in Nat. Herb. Pretoria!* Kloof between Klipfontein and Spitskop, *Burtt-Davy 13528 in Nat. Herb. Pretoria!*

Central Region: Sunday's River, Graaff-Reinet Div. *Ecklon and Zeyher 955 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* By water-courses, "The Water-furrow" near Graaff-Reinet, *Herb. Bolus 135!*

21. G. lanceolata, Glover in Ann. S. Afr. Mus. 9 (1915) 206.

Celastrus lanceolatus, E. Mey. ex Sond. in Harv. and Sond. Fl. Cap. i. *456; Catha patens, Presl. Bot. Bem. 33; Catha lanceolata, Presl l.c.*

A small glabrous glaucous-green spiny tree, reaching a height of twelve feet. *Branches* terete, greyish-white. *Twigs* lax, virgate, greyish-white. *Spines* strong, 4–5 cm. long, bearing leaves and inflorescences. *Leaves* alternate, coriaceous; petiole 2–5 mm. long, lamina 3–8 cm. long, 5–12 mm. wide, lanceolate, obtuse, mucronulate and narrowed towards the base, glaucous, with distinct penni-nerved venation and closely denticulate margins.

Inflorescence lax, cymose, axillary, several-flowered. *Peduncle* branching into two near the base, 1–5 mm. long; secondary branches about 5 mm. long. *Pedicels* 1–2 mm. long. *Flowers* 5-parted. *Sepals* 0·5 mm. long, deltoid, with a ciliated margin. *Petals* 1·5–2 mm. long, oblong or ovate, with a ciliated margin from the apex to half-way down the petal. *Filament* 0·75 mm. long, dilated at the base. *Disc* flat, fleshy, saucer-like, with a crenulated margin. *Ovary* 2–3-chambered, with 2 ovules in each chamber; style very short; stigmas shortly 2–3-lobed. *Fruit* not seen.

Western Region: Ramond's Drift, Verleptpram, Little Namaqualand *Drège in Herb. Kew!* Orange River, *Schlechter 11452 in Herb. Kew!* and *in Nat. Herb. Pretoria!* and *in Herb. Bolus!* Sandy banks, Orange River, *Pearson 6097 in Herb. Kew!* and *in Herb. Bolus!* Banks of Orange River near Abbasis, *Pearson 2998 in Herb. Kew!* and *in Herb. Musei Austro. Afric.! Pearson 3101 in Herb. Kew!* and *in Herb. Musei. Austro. Afric.!* and *in Herb. Bolus!*

22. G. tenuispina, Szysz, Enum. Polypet. Rehmann (1888) ii. 34.

Celastrus tenuispinus, Sond. in Harv. and Sond. Fl. Cap. i. 456. Gymnosporia loobsakelensis, Loesen.

A greyish shrub, bearing slender spines. *Branches* of two kinds; the long ones terete greyish-brown; the short ones very abbreviated and bearing tufts of leaves and the inflorescences. *Twigs* sub-terete, flexuous. *Spines* slender, reaching a length of 2 cm. and bearing abbreviated branches. *Leaves* tufted, sub-membranous; petiole about 2 mm. long; lamina 1–3·5 cm. long, 2–6 mm. wide, linear, mucronulate and narrowed towards the base, minutely downy beneath and on the petiole, with a minutely denticulated margin and veinless except for the conspicuous straw-coloured midrib. *Inflorescence* lax, few-flowered, axillary, cymose. *Peduncle* about 4 mm. long, very slender. *Flowers* immature. *Fruit* a 3-celled capsule, with yellowish-brown sub-membranous valves. *Seeds* dark brown, with a very small yellow aril at the base.

Kalahari Region: Eastern Bamaguato Territory, Bechuana Country, *Holub. in Herb. Kew!* Mochudi, Bechuanaland Protectorate, *Harbor 6314 in Herb. Kew!* and *in Herb. Musei Austro. Afric.! 9080!* Hill near Pretoria, *Marloth in Herb. Marloth 9521!* Pretoria Kopjes, *Leendertz 514 and 105 in Herb. Bolus!* Pretoria, *Conrath 741 in Herb. Kew!* Premier Mine, Transvaal, *Rogers 25047 in Herb. Bolus!* Rustenburg, *Olive Nation in Herb. Kew!* and *216 in Herb. Bolus!* Magaliesberg, *Burke 120 in Herb. Kew! Zeyher 305 in Herb. Kew! Zeyher 120 in Herb. Musei Austro. Afric.!* Middelburg, *Rattray in Nat. Herb. Pretoria!* Zeerust, *Burtt-Davy 103 in Nat. Herb. Pretoria!* Nylstroom to Springbok Flats, southern slope of nek, *Burtt-Davy 1730 in Herb. Bolus!* Kloofs near Mission Station, Botsabelo, *Marloth in Herb. Marloth 11762!*

No Locality: *Rogers 6228 in Herb. Bolus!*

23. G. elliptica, Davison comb. nov. (Pl. X, fig. 2.)

Celastrus ellipticus, Thunb. Sond. in Harv. and Sond. Fl. Cap. i. 458; Celastrus integer. Ecklon and Zeyher Enum. Plant. Afric. Austro. (1834–1837) 945, p. 120, not Celastrus integer, Thunb. Celastrus heterophyllus, Sond. l.c. partly excl. var.

An erect greyish shrub bearing slender spines. *Branches* of two kinds; the long ones terete, greyish-brown; the short ones very abbreviated and bearing tufts of leaves and the inflorescences. *Twigs* sub-terete. *Spines* slender, about 1 cm. in length. *Leaves* tufted, coriaceous; petiole 1–2 mm. long; lamina 1–4 cm. long, 2·5–6 mm. wide, linear with an obtuse or mucronulate apex and narrowed very much towards the base, smooth and veinless on the upper surface, veiny and rugulose beneath but the midrib not conspicuously prominent, with an entire or slightly serrated margin. *Inflorescence* axillary, cymose, not dense. *Peduncle* 0·4–1 cm. long, rather stout. *Flowers* 5-parted. *Sepals* 1 mm. long, orbicular, concave, with a laciniated margin. *Petals* 2 mm. long, oblong, with

Plate X.

1. *Gymnosporia filiformis*, Davison.
(Herb. Musei Austro. Afric. No. 7363.)

2. *Gymnosporia elliptica*, Davison.
(Cape of Good Hope Herb. No. 2160.)

an undulate margin. *Filaments* 1 mm. long, broader at the base. *Disc* fleshy, annular, with a crenulate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style very short; stigmas 3, linear, 0·5 mm. long. *Fruit* a dry capsule 4 cm. long.

Coast Region: Gauritzrivier, George, *Ecklon and Zeyher 945 in Herb. Musei Austro. Afric.!!* Gamtoos River, *Schlechter 6043 in Herb. Kew!* Uitenhage: *Zeyher 395! 707 in Herb. Kew!* Olifantshoek, Bosjesman's Rivier, Uitenhage, *Ecklon and Zeyher 943 in Herb. Kew!* Uitenhage, *Zeyher 2180 in Herb. Musei Austro. Afric.!* Between Uitenhage and Algoa Bay, *Burchell 4277 in Herb. Kew!* Albany: *Cooper 1523 in Herb. Kew! Zeyher in Herb. Kew!* Grahamstown, *MacOwan 290 in Herb. Kew!* Gwatyn Farm, Queenstown, *Galpin 8300 in Herb. Kew!* and *in Nat. Herb. Pretoria!*

Eastern Region: Grassy plains, Tugela, Natal, *Gerrard 1587 in Herb. Kew!* and *in Govt. Herb. Natal!*

No Locality: *Zeyher 2181 in Herb. Kew!*

24. G. Bachmannii, Loesen. in Engl. Bot. Jahrb. 19 (1894) 232.

Glabrous. *Spines* small, slender, few. *Twigs* closely set, slender, distinctly angular-striate, rather densely leafy. *Leaves* shortly and slenderly petiolate, chartaceous, narrow or sublinear-lanceolate; very much narrowed at the base and acute; apex obtuse or rotundate, with the margin closely serrulate, and with the veins prominent below, reticulate. *Inflorescence* solitary in the axils of the leaves, a little shorter than the leaves, few-flowered, dichotomous. *Fruit* a 3-locular capsule, 3–6-seeded. *Seeds* covered below by the pale yellow aril, uncovered above.

Eastern Region: Pondoland, *F. Bachmann 847 in Herb. Kew.*

25. G. peduncularis, L. Bolus in Ann. Bolus ii (1916) 13.

Pegler in Ann. Bolus Herb. ii, *13* (*name only*); *Sim in Forests and Forest Flora Cape Colony* (*1907*) *184*; *Celastrus peduncularis, E. Mey ex Sond. in Harv. and Sond. Fl. Cap.* i, *454*; *Ilex flexuosa, E. Mey. in Hb. Drègeony, name only.*

An unarmed tree 15–25 feet high. *Branches* terete, greyish-brown. *Twigs* sub-angular, softly pubescent. *Leaves* alternate, sub-membranous; petiole 3–6 mm. long, grooved above; lamina 2–8 cm. long, usually 5 cm. long and seldom less than 5 cm. long, 0·8–3·5 cm. wide, elliptic or elliptic-ovate, obtusely sub-acuminate, narrowed slightly towards the base; paler beneath, with distinct venation and a crenato-serrate margin; the young leaves slightly pubescent beneath. *Inflorescence* axillary, cymose, few-flowered, pubescent. *Peduncle* 1–1·5 cm. long, pubescent. *Flowers* 5 parted. *Sepals* 0·75 mm. long, sub-orbicular, pubescent on the outside and with a brown-edged laciniated margin. *Petals* 1·75 mm. long, fleshy, sub-orbicular, slightly narrowed at the base, and with an uneven margin. *Filaments* 0·5 mm. long. *Disc* fleshy, slightly enveloping the base of the ovary. *Ovary* 2-chambered, with 2 ovules in each chamber; style 0·25 mm. long; stigma entire. *Fruit* a 2-locular dry obovate capsule about 1 cm. long. *Seed* compressed with a membranous yellow aril.

Coast Region: Knysna, *Burchell 5397 in Herb. Kew!* Gouna Forest, Knysna Div., *Fourcade 1896 in Herb. Fourcade!* Main Forest Deepwaals, Knysna, *Keet 605 in Nat. Herb. Pretoria!* Blaauwkrantz, Bathurst Div. *Burchell 3671 in Herb. Kew!* Blaauwkrantz, Zitzikamma, *Fourcade 678 in Herb. Bolus!* and *in Herb. Fourcade!* Mountains near Grahamstown, *MacOwan 75 in Herb. Kew!* near Grahamstown *MacOwan in Herb. Bolus 1046!* Albany, *Zeyher 885 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Howisonspoort, near Grahamstown, *Zeyher 2187 in Herb. Musei Austro. Afric.!* and *in Herb. Kew!* Bushy slopes, Lower Albany, *Tyson in Govt. Herb. 13415!* Bushy slopes round Grahamstown, *Tyson in Herb. Musei Austro. Afric. 2517!* Junction Farm, Gwatyn, Queenstown Dist. *Galpin 8260 in Nat. Herb. Pretoria!* East London, *Rattray 287 in Herb. Kew!* On a krantz near Naboon River Mouth, East London, *Rattray in Galpin Herb. 7771!* Perie Forest, *Scott-Elliot 892 in Govt. Herb. Natal 4640!* Inaeu Forest, Toise River, *Galpin 7379 in Herb. Bolus! and in Nat. Herb. Pretoria!* Woods near Komgha, *Flanagan 274 in Nat. Herb.*

Pretoria ! Flanagan 4 in Herb. MacOwan 2075 ! Prospect Farm, Komgha Dist. *Flanagan in Herb. Musei. Austro. Afric. 3600 !* Kentani, *Pegler 758 in Herb. Bolus !* Along streams, Kentani, *Pegler 758 in Nat. Herb. Pretoria !* British Kaffraria, *Cooper 33 in Herb. Bolus !* and *in Herb. Kew !* and *in Govt. Herb. Natal 8579 !* Between Kei River and Gekau, *Drège in Herb. Kew !* Fort Cunynghame, Kaffraria, *Sim 1922 in Nat. Herb. Pretoria ! Sim 2022 in Herb. Maritz. Univ. Coll. 1677 ! Sim 2166 in Herb. Bolus !*

Kalahari Region : Near Bester's Vlei, Harrismith, Orange Free State, *Bolus in Herb. Bolus 8136 !* Barberton, *Van Dam in Herb. Trans. Mus. 21124 !* Berlin, Godwan River, Barberton District, *Davidson and Hofmeyr 44 in Nat. Herb. Pretoria !*

Eastern Region : Eastern Districts, *MacOwan 233 in Herb. Kew !* Van Reenen, *Frankes and Wood No. 12153 in Govt. Herb. Natal 13702 !* Port Natal, *Gueinzius in Herb. Kew !* Inanda, Natal, *Wood 810 ! and 1604 in Govt. Herb. Natal ! 624 in Herb. Bolus !* and *in Herb. Kew ! Wood 940 in Herb. Kew !* Natal : *Gerrard 1371 in Herb. Kew ! Cooper 2161 in Herb. Kew ! Sutherland in Herb. Kew ! Mrs. K. Saunders in Herb. Bolus !* Howick, Natal, *Schlechter 6780 in Herb. Bolus !* Natal and Zululand, *Gerrard 1373 in Herb. Kew !* Nkandkla, Zululand, *Wylie Herb. Wood No. 8760 in Nat. Herb. Pretoria !* Zululand, *Davis 102 in Govt. Herb. Natal 8783 !*

Without Locality : *Gerrard and McKen in Govt. Herb. Natal 618 ! and 17205 !*

Sim, in the Forest Flora of Cape Colony, says of this plant : " Abundant throughout the Eastern and Transkeian Conservancies and Natal, both inside and outside the forests, from the coast up to 6,000 feet altitude and reserved in all the conservancies except the Transkeian under the name *Celastrus pedunculatus*. Bark dark grey outside, red-streaked with white inside, smooth and clean like English beech, getting rough when very old, that of the branches changing to nearly black when dry, and adhering to the wood ; in this state the branches are much used by the natives for knob-kerries. Trunks usually damaged when over two feet diameter and are irregular, but up to that size they have fine clean boles. Timber heavy, hard, tough, and elastic ; sapwood white, heartwood of a dark-grey colour, nearly black when fully mature, close-grained, and showing about thirty rings per inch. Often used in the construction of wagons, and for handles, etc. Not sufficiently known, possibly on account of its variability. In young plants and coppice shoots the leaves are often larger and more ovate than described above."

The common names for this plant are " Blackwood " ; Dutch. " Swarthout " ; Kaffir. " Umncai."

26. G. rubra, Loesen in Bull. Herb. Boiss. 4. 430.

Pegler in Ann. Bolus Herb. ii, *13* (*name only*). *Celastrus ruber, Harv. in Harv. and Sond. Fl. Cap.* ii, *592 ; Celastrus coccineus, N.E. Br. in Kew Bull.* (*1906*) *16.*

A glabrous spiny shrub. *Branches* angular, greyish-brown, slightly pubescent. *Spines* slender. *Leaves* alternate, membranous ; petiole about 5 mm. long ; lamina 1·5–2·5 cm. long (never exceeding 3 cm.), 1–1·5 cm. wide, ovate or ovate-rounded, obtuse, sub-cordate at the base with a serrulate margin. *Inflorescence* axillary, cymose, 2–3-flowered. *Peduncle* thread-like, 0·6–1·5 cm. long, pubescent. *Pedicel* 2–3 mm. long. *Flowers* 5 parted. *Sepals* 0·75 mm. long, suborbicular with a ciliated margin. *Petals* 2 mm. long, elliptic, obtuse, with a minutely and irregularly denticulated margin. *Filaments* 1 mm. long. *Disc* fleshy, partly enveloping the base of the ovary. *Ovary* 3-chambered with 2 ovules in each chamber ; style 0·25 mm. long ; stigmas 3, linear, 0·25 mm. long. *Fruit* not seen.

Kalahari Region : Tzaneen, Northern Transvaal, *Rogers 18842 in Herb. Kew !* **Zoutpansberg, Transvaal,** *Worsdell in Herb. Kew !*

Eastern Region : Umtata, Transkei, *Schlechter 6350 in Herb. Bolus !* Dumisa Station, Alexandra Dist. Natal, *Rudatis 1164 in Herb. Kew !* Inanda, Natal, *Wood 1395 in Herb. Kew ! Wood 1395 in Col. Herb. Natal 5730 !* Lidgeton, Natal, *Wood 6336 in Herb. Kew !* and *in Govt. Herb. Natal 8592 !* Natal, *Gerrard in Herb. Kew !* Entumeni, Zululand, *Wood 3963 in Herb. Bolus !* and *in Herb. Kew ! and in Govt. Herb. Natal 4767 !* Indeni Forest, Zululand, *Wood 7896 in Herb. Kew !* and *in Govt. Herb. Natal 12349 !*

27. G. laurina, Bolus and Wolley-Dod in Trans. S. Afri. Phil. Soc. xiv, 247.

Szysz. En. Polypet. Rehmann (1888) ii, *34. Scytophyllum laurinum, Ecklon and Zeyher Enum. Plant. Afr. Austro. (1834–1837) 966. p. 124; Sond. in Harv. and Sond. Fl. Cap.* i. *471; Celastrus laurinus, Thunb. Fl. Cap. ed. Schultz. (1827) 217; Scytophyllum obtusum, Ecklon and Zeyher l.c. 965, excl. syn. Celastrus laurinus and Celastrus obtusus, Drège Herb.; Celastrus oleoides, Lam. Ill. 2695.*

A glabrous unarmed shrub 8–10 feet high. *Branches* terete, greyish-brown. *Twigs* sub-angular, whitish. *Leaves* alternate, coriaceous; petiole 2–4 mm. long, lamina 2–6 cm. long, 0·5–3 cm. wide, usually obovate, sometimes ovate-oblong, rounded or emarginate at the apex or sometimes very obtusely acuminate, narrowed towards the base, rugose, not nervose, glaucescent, with an entire revolute margin. *Inflorescence* axillary, cymose. *Peduncle* glabrous, 3–5 mm. long. *Flowers* 5-parted. *Sepals* 2; outer ones 0·75 m.m. long, deltoid, with a brown-edged laciniated margin: 3 inner ones 1 mm. long, sub-orbicular with a brown-edged laciniated margin. *Petals* 2·25 mm. long, sub-orbicular or broadly oblong, flecked with brown and with an uneven margin. *Filaments* 1 mm. long. *Disc* fleshy, annular. *Ovary* 3-chambered, with 2 ovules in each chamber; style very short; stigmas 3. *Fruit* fleshy, obovate, 0·6–1 cm. long, finally dehiscent. *Seed* covered with a thin yellow aril.

Western Region: Khamiesberg, Khoms River, *Pearson 6648 in Herb. Kew!* near Ezelsfontein, *Pearson 6317 in Herb. Kew!* and in *Herb. Musei Austro. Afric. 7295!* Middle and upper slopes of Zuurberg, *Pearson 6254 in Herb. Kew!* and *in Herb. Bolus!* Sneeuwkop, *Pearson 5832 in Herb. Kew!* Namaqualand, N.E. of Stinkfontein, *Pearson 5635 in Herb. Kew!* Bushmansland, Kweekfontein, *Pearson 5042 in Herb. Kew!* and *in Herb. Musei Austro. Afric. 7318!* and *in Herb. Bolus!* Little Namaqualand, Rattelpoort Mountain; *Pearson 2962 in Herb. Kew!* and *in Herb. Musei Austro. Afric. 7309!* Rattelpoort, *Pearson 4722 in Herb. Kew!* Leeuwfontein, Cape, *Pearson 3229 in Herb. Kew!*

Coast Region: Mountains, Heerelogemont, Van Rhynsdorp Dist. *Zeyher in Herb. Musei Austro. Afric.!* Olifants River, *Schlechter 5035 in Herb. Bolus!* Olifants River Valley near Warmbaths, *Stephens 7258 in Herb. Kew!* and *in Herb. Musei Austro. Afric. 7303!* Olifants River, near Clanwilliam, *Dickson in Herb. Bolus 5608!* and *in Herb. Kew!* Clanwilliam, *Rogers 16841 in Herb. Kew!* Bergvalley, Clanwilliam, *Ecklon and Zeyher 967 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Kradouw, Cape, *Pearson 5282 in Herb. Kew!* Kardouw, Clanwilliam, *Zeyher in Herb. Musei Austro. Afric.!* Modderfontein near Piquinier's Kloof, *Schlechter 7961 in Herb. Kew!* and in *Herb. Bolus!* and *in Nat. Herb. Pretoria!* and *in Herb. Natal 13226!* near Piquetberg in *Herb. Bolus!* Western edge of Bokkeveld, *Marloth in Herb. Marloth 7627!* Ceres, *Pearson 3499 in Herb. Kew and in Herb. Musei Austro. Afric. 7306!* and *in Herb. Bolus!* near Ceres, *Bolus in Herb. Bolus 8332!* Bain's Kloof, near Wellington, *Zeyher in Herb. Musei Austro. Afric.!* Kloof near Tulbagh: *Burchell 1020 in Herb. Kew!* Winterhoek, Tulbagh, *Zeyher in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* near Waterfall, Tulbagh, *Ecklon and Zeyher 965 in Herb. Musei Austro. Afric.!* Du Toit's Kloof, Worcester Div. *Drège in Herb.* Worcester Div. *Drège in Herb. Kew! Cooper 1655! 1701 in Herb. Kew!* Hex River, *Marloth in Herb. Marloth 2202 b!* Hex River, near De Doorns, *Bolus in Herb. Bolus 13087!* Paarl Mountain, *Drège in Herb. Kew!* Camp's Bay, *Alexander Prior in Herb. Kew! MacOwan 2549! Bolus No. 183 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* and *in Herb. Bolus 183!* and *in Nat. Herb. Pretoria! Marloth in Herb. Marloth 5614!* Table Mountain, *Drège "a" in Herb. Kew!* Orange Kloof, west slopes, Table Mountain, *Woolley-Dod 2507 in Herb. Bolus!* and *in Herb. Kew!* sides of Table Mountain and Devil's Peak, *Ecklon and Zeyher 966 in Herb. Kew!* Devil's Mount, Capetown, *Alexander Prior in Herb. Kew!* Thickets near Capetown, *Alexander Prior in Herb. Kew!* Northern slopes of Table Mountain, *Pillans 3692 in Nat. Herb. Pretoria!* Wynberg, *Alexander Prior in Herb.* Kew! Mountain slopes. Muizenberg, *St. C. Caporn in Nat. Herb. Pretoria!* Muizenberg, *in Herb. Musei. Austro. Afric!* Simon's Bay, *Alexander Prior in Herb. Kew!* Seashore, Simonstown, *Bolus in*

Herb. Bolus 4933 ! top of Red Hill, Simonstown: *Wolley-Dod 2648 in Herb. Kew ! Wolley-Dod 2647 in Herb. Bolus !* Miller's Point, *Wolley-Dod 2271 in Herb. Kew !* Smit-Winkel's Bay, *Wolley-Dod 2686 in Herb. Kew !* Hottentot-Holland Mountains, Stellenbosch, *Ecklon and Zeyher 966 in Herb. Kew !* and *in Herb. Musei Austro. Afric. !* Mountains near French Hoek: *Bolus in Nat. Herb. Pretoria ! Phillips 1079 and in Herb. Musei Austro. Afric. 8279 !* French Hoek, *Eullene in Herb. Bolus 2746 !* Sir Lowry's Pass, *Schlechter 4829 in Herb. Bolus !* and *in Herb. Kew !* Genadendaal near Caledon, *Pappe in Herb. Musei Austro. Afric. !* S. slopes Zwartberg, Caledon, *Pillans in Herb. Bolus 17144 !* Cape of Good Hope, *Cooper 2696 in Herb. Kew !* Cape Agulhas and Potberg, *Drège in Herb. Musei Austro. Afric. !* Corente River Farm, Riversdale Dist. *Muir 47 in Herb. Galpin 5069 !* George, *Alexander Prior in Herb. Kew !* Keurbooms River, Long Kloof, George, *Fourcade 1645 in Herb. Fourcade !* Uniondale Div., *Burchell 5065 in Herb. Kew !* Avontuur, Uniondale, *Fourcade in Herb. Fourcade !* Prince Alfred's Pass, Uniondale, *Fourcade 2474 ! 1277a ! 2057 in Herb. Fourcade ! Fourcade 2057 in Herb. Bolus !* Lange Kloof, Humansdorp Div., *Burchell 4921 in Herb. Kew !* Langevalley, *Zeyher 306 B in Herb. Musei Austro. Afric. !*

Without Locality: *Dr. Wallich in Herb. Kew ! Zeyher 306 in Herb. Kew !*

28. G. filiformis, Davison sp. nov. (Pl. X, Fig 1.)

Frutices glabri, inermes. *Rami* teretes, cano-fusci. *Ramuli* angulati, cano-fusci. *Folia* alterna, membranacea; petioli 1–1·5 mm. longi; laminae 2–5 cm. longae, 1·3-3·3 cm. latae, infra pallidiorae, ellipticae, acuminato-obtusae quandam apiculatis minutis; basi rotundati; margines serrati; nervi et costa prominentes. *Inflorescentia* cymosa, 2–3 floribus. *Pedunculi* filiformi, circa 2 cm. longi. *Flores* 5-parti. *Sepala* 1 mm. longa, sub-membranacea, orbiculata, marginibus integris. *Petala* 2 mm. longa, lato-oblonga, marginibus undulatis. *Filamenta* brevissima, ad 0·25 mm. longa. *Discus* carnosus. *Ovarium* 3-loculare, disci immersum. *Stigma* capitata. *Fructus* non vidi.

Eastern Region: Near Durban, *Wood 11608 and in Herb. Musei Austro. Afric. 7363 !* Berea, Durban, *Wood 9987 and in Gov. Herb. Natal 10543 !* Sydenham, *Wood 8257 and in Govt. Herb. Natal 9205 !* Inanda, Natal, *Wood 734 in Herb. Kew !* and *in Herb. Bolus ! Wood 734 and in Govt. Herb. Natal 5072 !*

29. G. acuminata, Szysz. Enum. Polypet. Rehm. 2: 34 (1888).

Pegler in Ann. Bolus Herb. ii. *13* (*name only*). *Celastrus acuminatus, Linn. Suppl. 154; Sond. in Harv. and Sond. Fl. Cap.* i. *454; Thunb. Fl. Cap. 218; Ecklon and Zeyher Enum. Plant. Afric. Austro.* (*1834–1837*) *927, p. 118*; *Pappe Syls. Cap. 8*; *Celastrus populifolius, Lam Illustr. 2698*; *Celastrus rupestris and mucronatus, Ecklon and Zeyher Enum. Plant. Afric. Austro.* (*1834–1837*) *929, 930, p. 119*; *C.* (*?*) *Plectronia, DC. Prod.* ii. *9*; *Catha acuminata and rupestris, Presl. Bot. Bem. 33.*

A glabrous unarmed shrub or small tree, seldom over 20 feet in height and 12 inches in diameter breast high. *Branches* terete, dark grey or greyish-brown, with a thin bark, which is fissured only when old. *Twigs* angular. *Leaves* alternate, membranous or sub-coriaceous, with lengthwise elastic threads in the tissue; petiole 3–7 mm. long; lamina 2–11 cm. long, 0·6 cm. wide, ovate, or ovate-lanceolate, or elliptic-rhomboid in some of the coppice shoots, with the apex decidedly acuminate acute, and with a shortly cuneate base, distinctly veined, paler beneath, and with a serrate margin. *Inflorescence* axillary, solitary or cymose, few-flowered. *Peduncle* extremely short, 0·5–2 mm. long. *Pedicels* up to 0·5 cm. long, lengthening in the fruit. *Flowers* 5-parted. *Sepals* sub-orbicular; 2 outer ones 0·5 mm. long, with a yellowish-brown laciniated margin; 3 inner ones 1 mm. long, with a yellowish-brown laciniated margin. *Petals* 2·5 mm. long, sub-orbicular, with distinct yellowish-brown veins and an entire incurved margin. *Filaments* extremely short, never exceeding 0·5 mm. *Disc* fleshy, flat. *Ovary* 3-chambered, with 2 ovules in each chamber; stigmas sub-sessile, obsoletely 3-lobed. *Fruit* a dry abortively 1-locular obovate or obcordate **capsule up to 1 cm. long.** ***Seeds*** **covered with a thin yellow aril.**

Coast Region: Clanwilliam, *Rogers 16843 in Herb. Bolus!* on banks of stream at "Monte Cristo," Porterville, *Edwards 39 in Herb. Bolus!* Simonsberg, *Drège in Herb. Musei Austro. Afric.!* Paarl Mountain, *Drège in Herb. Kew!* Silverrivier, *Schlechter 2377 in Herb. Bolus!* Soldaten Bosch, western slopes of the Apostles, Cape Peninsula, *Pillans 3687 in Nat. Herb. Pretoria!* Devil's Mountain, Capetown, *Alexander Prior in Herb. Kew!* Rocks west side of Devil's Peak, *Wolley-Dod 1326 in Herb. Bolus!* and *in Herb. Kew!* Roadside, Orange Kloof, *Wolley-Dod 3282 in Herb. Kew!* Kirstenbosch, *Schlechter 241, 242 in Herb. Musei. Austro. Afric!* Nursery Gorge, above Kirstenbosch Cape Peninsula, *Page in Herb. Bolus!* and in *Nat. Herb. Pretoria!* Skeleton Ravine, *in Herb. Bolus!* Orange Kloof, *Marloth in Herb. Marloth 8443!* Newlands, *Wilms 3111 in Herb. Kew!* Newlands, *Marloth in Herb. Marloth 1621b.* Muizenberg, *Bolus 4623 in Herb. Bolus!* and *in Herb. Kew!* Stellenbosch, *Alexander Prior in Herb. Kew!* Jonker's Hoek, below trout hatchery, *Pillans in Herb. Bolus, 15470!* Genadendal, *Alexander Prior in Herb. Kew!* Zwartberg and near Genadendal, *Ecklon and Zeyher 927 in Herb. Bolus!* Mountain, Grootvadersbosch (Swellendam), *Pappe in Herb. Musei Austro. Afric.!* *Marloth in Herb. Marloth 3495!* Klynrivier, Caledon Dist., *Zeyher 2188 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Zoetmelk's River, Riversdale Div. *Burchell 6811 in Herb. Kew!* Georgetown, *Alexander Prior in Herb. Kew!* Zwartberg, *Alexander Prior in Herb. Kew!* Honitini Gorge, Farleigh, Knysna, *Keet 713 in Nat. Herb. Pretoria 3323!* Gouna River, Knysna, *Keet 710 in Nat. Herb. Pretoria 3320!* Concordia, Knysna, *Keet 711 in Nat. Herb. Pretoria 3321!* Knysna, *Duthie 606 in Herb. Bolus!* Plettenberg Bay, *Ecklon and Zeyher in Herb. Kew!* in a deep woody ravine near the Keurbooms River, Uniondale Div. *Burchell 5149 in Herb. Kew!* Forest Storm's River, Zitzikamma, *Fourcade 706 in Herb. Fourcade!* Bitou River near bridge in scrub forest, *Fourcade 1490 in Herb. Fourcade!* Wooded gorge, Zuurbraak Mtn. *Galpin 3882 in Nat. Herb. Pretoria!* North side of Kromme River, near Wagenbooms Station, Humansdorp Div., *Burchell 4882 in Herb. Kew!* Witte El's Bosch in forest, Humansdorp Div., *Fourcade 1409 in Herb. Fourcade!* Uitenhage, *Zeyher 812 in Herb. Kew!* *Zeyher 546 in Herb. Kew!* Zwartkop's River, Uitenhage, *Alexander Prior in Herb. Kew!* Van Staadens River, *Zeyher 2189 in Herb. Musei Austro. Afric.!* Wooded kloof, west of Grahamstown, Albany Div. *Burchell 3562 in Herb. Kew!* Grahamstown, *MacOwan in Herb. Kew!* Salatkraal not far from Grahamstown, Albany Div., *Ecklon and Zeyher 929 in Herb. Kew!* and *in Herb. Musei. Austro. Afric!* Grahamstown, *Atherstone in Herb. Kew!* Stony Vale, *Dr. Gill in Herb. Kew!* Grahamstown, *Schlechter 2670 in Nat. Herb. Pretoria!* Katrivier, Winterberge (Ceded Territory) *Ecklon and Zeyher 930 in Herb. Kew!* In forest at Torstoni, Dist. Stutterheim, *Galpin 7808 in Nat. Herb. Pretoria!* Wooded krantz, Naboom River, near mouth, *Galpin 5666 in Nat. Herb. Pretoria!* Woods near Komgha, *Flanagan 893 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric.!* and *in Herb. Bolus!* Faku's Territory, *Sutherland in Herb. Kew!* Qolora River, Kentani, *Pegler 1208 in Herb. Musei Austro. Afric.!* and *in Herb. Bolus!*

Central Region: Stormberg, *Drège 6745b in Herb. Kew!*

Kalahari Region: Orange Free State, *Cooper 2158 in Herb. Kew!* Houtbosch, Transvaal, *Rehmann 6571 in Herb. Kew!* Wooded kloof, Pig's Peak, Swaziland, *Galpin 1335 in Herb. Bolus!* and in *Herb. Kew!* and *in Nat. Herb. Pretoria!*

Eastern Region: In valley near Chivenka River, Tembuland, *Bolus in Herb. Bolus!* Engeoba mountain, Tembuland, *Flanagan 2742 in Nat. Herb. Pretoria!* in mountain, Engcoba, Tembuland, *Bolus 8826 in Herb. Bolus!* and *in Herb. Kew!* Soukine Forest, Port St. Johns Dist. *Forester Boshoff in Herb. Forest Dept. No. 4993 in Nat. Herb. Pretoria!* Woods near Port St. Johns, *Flanagan 2563 in Herb. Bolus!* near Durban, *Wood in Govt. Herb. Natal 8850!* Palmiet, *Wood 11609 in Nat. Herb. Pretoria!* and in *Herb. Bolus!* and *in Herb. Maritzburg Univ. Coll. 1674!* Natal, *Gerrard 1372 in Herb. Kew!* Inanda, Natal, *Wood 1338 in Herb. Kew!* and *in Col. Herb. Natal 5732!* Natal and Zululand, *Gerrard 1586 in Herb. Bolus! and in Herb. Kew!*

Without Locality: *In Govt. Herb. Natal 2849!*

When the fresh leaves of this plant are broken elastic strands of tissue are seen.

Sim (Forests and Forest Flora of Cape Colony (1907) 184) says of this plant: "It occurs throughout the forest and scrub districts of each conservancy, from the coast up to 6,000 feet, more usually as a gnarled shrub among rocks than as a forest tree; in some mountain patches it is one of the most abundant species, as at Cathcart and on the Drakensberg; it also occurs in Pondoland, Natal, and Transvaal. Though reserved in all the conservancies (under the name *Celastrus acuminatus*), the wood is not, so far as I am aware, used at all, probably on account of its small size and branched habit."

Pappe (Silva Capensis 8) says of this plant: "When polished it displays beautiful shades. To the joiner it furnishes a splendid material for fancy work; by the turner it will be found very serviceable for wooden screws, etc., as also by the manufacturer of musical instruments. In the colony it has hitherto chiefly been used by wheelwrights. . . . It is harder and tougher than the European yoke-elm."

Fourcade (Report on Natal Forests 100, 132) says of this plant: "Wood very heavy, hard, strong, very close-grained and compact, with close and narrow concentric bands of white tissue; medullary rays very fine and close; pores very small, irregularly distributed; colour pale pink tinged with brown; suitable for turner's work and engraving. . . . Weight per cubic foot, 60·6 lb.; relative hardness, 6·0.

"At Knysna elephants are very partial to the foliage of this tree, and numbers are pulled down by them, especially in the swampy places."

G. acuminata, var. **microphylla,** Davison comb. nov.

Celastrus acuminatus, var. microphyllus, Sond. in Harv. and Sond. Fl. Cap. i. *454; Celastrus microphyllus, Ecklon and Zeyher Enum. Plant. Afric. Austro. 928 non. Thunb.*

Coast Region: Avontuur (Uniondale), *Marloth in Herb. Marloth 10938!* Woodvale Forest, Gwatyn, Queenstown Div., *Galpin 8085 in Nat. Herb. Pretoria!* Hogsback Mt., King Williams Town Div. *Rattray 294 in Herb. Bolus!* Yellowwoods, Kaffraria, *Sim 1193 in Nat. Herb. Pretoria!* Fort Cunynghame, *Bolus in Herb. Bolus 8827!*

Kalahari Region: Leribe, Basutoland, *Mrs. Dieterlen 553 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric. 3861!*

30. G. harveyana, Loesen. in Bull. Herb. Boiss. 4 (1896) 429.

A glabrous spinuous shrub. *Branches* of two kinds; the long ones striate-angular, greyish-brown, the twigs tetragonous; the short branches very abbreviated and bearing tufts of leaves. *Spines* very slender. *Leaves* alternate on the longer branches, tufted on the short branches, membranous, stipulate; stipules sub-filiform, about 2 mm. long; petiole 5–8 mm. long, slender; lamina 2–4·5 cm. long, 1–2·5 cm. wide, ovate or elliptic-rhomboid, rounded or slightly obtusely-acuminate, with a minute indentation at the apex (the leaves on the short shoots never acuminate) and a cuneate base; margin crenato-serrulate; venation closely reticulate, with the midrib and veins slender and prominent on both surfaces. *Inflorescence* frequently solitary in the axils of the leaves, cymose. *Peduncle* slender, 0·7–2 cm. long. *Pedicel* 1·5–2 mm. long. *Flowers* not seen. According to Loesener (in "Bull. de L'Herb. Boiss." 4, 431: "Sepals 5, rotundate, ciliolate; petals and stamens 5: ovary 3-chambered." *Fruit* a dry capsule, 5–6 mm. long.

Variety Galpin 7840 (?).

Coast Region: Near Mt. Cota, King Williamstown, *Galpin 7840 in Nat. Herb. Pretoria!* Kentani, *Pegler 298 in Herb. Kew!*

Kalahari Region: Slangaapies Mountains, Wakkerstroom, *Burtt-Davy in Trans. Col. Herb. 3506!* along streams in dense shade, Barberton Mountains, *Burtt-Davy in Trans. Col. Herb. 332! and in Herb. Bolus!* Modjadji, Pietersburg Div., *Rogers 18114 in Herb. Bolus!* Potatobosch No. 2013, Zoutpansberg, near stream, *Burtt-Davy in Trans. Col. Herb. 1210!* Haenertsberg, road from Potatobosch to Zeederberg's Dam, *Burtt-Davy 1265 in Herb. Bolus!* New Agatha, near Tzaneen, N. Transvaal, *Rogers 18842 in Herb. Kew!*

Eastern Region: Puffadder, E. Pondoland, *Sim 2485 in Herb. Bolus!* Natal, *Gerrard 285 in Herb. Kew!* Krantz Kloof, between Durban and Maritzburg, *Schlechter 3192 in Herb. Bolus!*

31. G. crataegiflora, Davison sp. nov. (Pl. XVIII.)

Arbores vel frutices, glabri, spinosi. *Rami* teretes, cano-fusci. *Ramuli* sub-angulati. *Folia* alterna, coriacea: petioli crassi, 2–3 mm. longi; laminae 3–7 cm. longae, 1·5–5 cm. latae: utrinque nervis elevatis, obovatae vel sub-orbiculatae, in basin cuneatae, apices rotundatae apiculatis brevibus; margines grossis serratis. *Inflorescentia* glomerata, densa: flores subsessili. *Pedunculi* circa 1 mm. longi, crassi, in fructe leviter longiori ad 5 mm. *Flores* 5-parti. *Sepala* 1–1·5 mm. longa, sub-orbiculata, marginibus fimbriatis. *Petala* 2·5–3·5 mm. longa, lato-obovata vel suborbiculata, carnosa. *Filamenta* 1 mm. longa, baso latiore. *Discus* carnosus, annularis, margine crenulato. *Ovarium* 3-loculare, ovula in loculis 2, erecta: stigmata 3-lobo, sessile. *Fructus* capsularis valvis ligniis tarde dehiscens. *Semina* fusca, infra immersa in arilo ochro membranacea.

Eastern Region: Inanda, Natal, *Wood 212 in Herb. Kew!* and in *Herb. Bolus!* Natal and Zululand, *Gerrard 1379!* (?) *Wood 517 in Herb. Bolus!*

Eastern Region: Inanda, Natal. *Wood 212 in Herb. Kew!* and in *Herb. Bolus! Wood 517 in Herb Bolus!*

Without Locality: *Fourcade in Herb. Fourcade!*

32. G. angularis, Sim Forest and Forest Flora Cape Col. 1907, 186.

Pegler in Ann. Bolus Herb. ii, *13* (*name only*). *Celastrus angularis, Sond. in Harv. and Sond. Fl. Cap.* i. *460.*

A glabrous much-branched sparsely spiny shrub about 3–6 feet high. *Branches* of two kinds: the long ones distinctly striated; the short ones very much abbreviated and bearing tufts of leaves and inflorescences. *Twigs* angular-striated. *Spines* present only on the young flowerless shoots, very small and not more than 2 cm. long. *Leaves* usually tufted, thinly coriaceous; petiole 1–3 mm. long: lamina 0·7–3 cm. long, 0·2–2 cm. wide, usually spathulate-obovate, rounded, emarginate, often with a recurved point at the apex, cuneate, veinless on the upper surface, but the veins distinct on the under surface and with a spinuloso-serrate margin. *Inflorescence* cymose, solitary or several together, fairly lax. *Peduncle* 0·3–1 cm. long. *Pedicels* 2–3 mm. long. *Flowers* 5-parted. *Sepals* 0·75 mm. long, sub-orbicular, with a laciniated margin. *Petals* 2 mm. long, elliptic or broadly oblong, with a slightly laciniate undulate margin and brown veins down the centre. *Filaments* 1 mm. long. *Disc* fleshy, annular, with a slightly lobed margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 0·5 mm. long; stigma shortly 3-lobed. *Fruit* a dry capsule about 3 mm. long.

Coast Region: Van Staadens, *Zeyher 2182 in Herb. Musei Austro. Afric.!* Hills at Grahamstown, *Alexander Prior in Herb. Kew!* Hillsides, Grahamstown, *Galpin 340 in Nat. Herb. Pretoria!* Dassie Krans, Grahamstown, *Galpin 2916 in Nat. Herb. Pretoria!* Albany, *Atherstone 104 in Herb. Kew!* Grahamstown, *Pappe in Herb. Kew!* Mountains near Grahamstown, *MacOwan 712 in Nat. Herb. Pretoria!* and *in Herb. Bolus 712!* and *in Herb. Musei Austro. Afric.!* Shrubby places near Komgha, *Flanagan 474 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric.!*

Kalahari Region: Transvaal, *Sanderson in Herb. Kew!* Pilgrim's Rest, Lydenburg, Transvaal, *Rogers 14872 in Herb. Bolus!*

Eastern Region: Tugela, *Haygarth* (*Wood No. 1008*) *in Govt. Herb. Natal 10909!* Natal, *Gerrard 1375 in Herb. Kew!* Clairmont Flat, Natal, *Wood 7859 in Herb. Bolus!* and in *Herb. Kew!* and *in Nat. Herb. Pretoria!* Inanda, Natal, *Wood 633 in Herb. Kew! Wood 633 and in Col. Herb. 5734!* and *in Herb. Musei Austro. Afric.!* and *in Herb. Bolus! Wood in Govt. Herb. Natal 2066!* Mount Edgecombe, Inanda, Natal, *Wood 1139 in Herb. Kew! Wood 1139 and in Col. Herb. Natal 5735!* near Grooms, Inanda, *Wood 1672 in*

Plate XVIII.

Gymnosporia crataegiflora, Davison.

(Wood 212.)

Col. Herb. Natal 5736! Dumisa Station, Alexandra, Natal, *Rudatis 543 in Herb. Kew!* Pinetown, Natal, *Wood in Herb. Musei Austro. Afric. No. 1119* and *in Herb. Kew!* and in *Herb. Musei. Austro Afric. 1119!* Tongaat, North Coast, Natal. *Wood 8373* and *in Govt. Herb. Natal 9116!* Zululand, *McKenzie in Herb. Kew!* Natal, *Saunders in Herb. Bolus!*

WITHOUT LOCALITY: *Gerrard and McKen 1376 in Govt. Herb. Natal 620!*

G. angularis, Sim. var. **orbiculata,** Davison.

Leaves often measuring up to 3·5 cm. more or less orbicular.

COAST REGION: In scrub on sea coast at East London, *Galpin 1870 in Herb. Kew!* and *in Nat. Herb. Pretoria!* Kei Bridge, Komgha Div., *Mason in Herb. Kew!* Outskirts of woods, Kentani, *Pegler 741 in Herb. Kew!* and *in Herb. Bolus!* and in *Herb. Musei. Austro Afric.!* Kentani, *Pegler 1244 in Herb. Bolus!*

EASTERN REGION: Dumisa Station, Alexandra Dist., Natal, *Rudatis 1117 in Herb. Kew!* Eastern Districts, *Cooper 144 in Herb. Kew!* Natal and Zululand, *Gerrard 1377 in Herb. Kew!*

G. angularis, Sim. var. **grandifolia,** Davison.

Twigs sub-terete, not angular and striated. *Leaves* always more than 2 cm. long, measuring up to 8 cm., obovate, with the midrib and lateral veins raised and very distinct below.

COAST REGION: Pirie Forest, *Galpin 5917 in Herb. Kew!* and in *Nat. Herb. Pretoria!* Pirie, *Sim 1318 in Herb. Bolus!* Kingwilliamstown, *Tyson in Herb. Bolus!* Woods near Komgha, *Flanagan 316 in Nat. Herb. Pretoria!* Prospect Farm near Komgha, *Flanagan in Herb. Musei Austro. Afric.* 3608*!*

This variety may form a separate species intermediate between *G. angularis* and *G. nemorosa.* The material available is insufficient to warrant a new species being formed on it, and it appears wiser to retain this as a variety of *G. angularis* as the inflorescence is very similar, until more complete material has been seen.

33. G. nemorosa, Syzsz. "Enum. Polypet. Rehmann" ii, 34 (1888).

Celastrus nemorosus, E. and Z. Sond. in Harv. and Sond. Fl. Cap. i. *460.*

A glabrous spiny shrub. *Branches* of two kinds; the long ones terete, greyish-brown, somewhat verrucose; the short ones very abbreviated, bearing tufts of leaves and the inflorescences. *Twigs* sub-angular. *Spines* strong, up to 5 cm. long, borne on and below the flowering branches. *Leaves* alternate or tufted, sub-coriaceous; petiole 2–8 mm. long; lamina 3–6·5 cm. long, 1·5–3·5 cm. wide, obovate or elliptic above the shortly narrowed base, about twice as long as broad, somewhat glaucous above, rounded at the apex or slightly emarginate, with a shortly cuneate base, with distinct venation, and with a dentato-serrate margin. *Inflorescence* cymose, lax, solitary, or 2–3 together. *Peduncle* 0·5–2·5 cm. long, slender. *Fruiting pedicel* 0·8–1 cm. long, slender. *Flowers* 5 parted. *Sepals* 1–1·5 mm. long, sub-orbicular, with the margin laciniated at the rounded apex and half-way down. *Petals* 2–2·5 mm. long, broadly oblong, with an uneven undulate margin. *Filaments* 1 mm. long. *Disc* fleshy, collar-like round the base of the ovary and with a slightly lobed margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 0·25–1 mm. long; stigmas 3, linear. *Fruit* not seen.

COAST REGION: Knysna, *Burchell 5524* and *5526* in *Herb. Kew!* Katjes Kraal, Knysna Div., *Burchell 5238 in Herb. Kew!* near seashore, Plettenberg Bay, *Fourcade 1050 in Herb. Fourcade!* forest east of Clarkson, Zitzikamma, *Fourcade 1404 in Herb. Fourcade!* Krakakamma, Addow and Olifantshoek, Uitenhage, *Ecklon and Zeyher 938 in Herb. Musei. Austro. Afric!* Howisonspoort near Grahamstown, *Zeyher 2183 in Herb. Musei. Austro Afric.!* Grahamstown, *Burchell 3593 in Herb. Kew! Zeyher 2184 in Herb. Musei. Austro Afric.! MacOwan in Herb. Kew!* Junction Farm, Gwatyn, Queenstown Dist., *Galpin 8087 in Nat. Herb. Pretoria!* Kingwilliamstown, *Sim 1145 in Herb. Bolus!* Forest, Baziya Mt., Kaffraria, *Baur 124 in Herb. Kew!*

Eastern Region: (North of Entufufu Drift, main road, Lusikiski Dist., *Miller in Herb. Forest Dept. 4453!*; Port Natal, *Grant in Herb. Kew!* sea coast near Durban, *Wood 11408 in Herb. Bolus!* and *in Herb. Musei Austro. Afric. 3898!* and in *Govt. Herb. Natal 12429!* Berea, Durban, *in Govt. Herb. Natal 15468!* *Wood 11864 in Govt. Herb. Natal 12487!* Springfield, *Wood in Govt. Herb. Natal 15741!* Inanda, Natal, *Wood 1297 in Herb. Bolus!* Natal, *Cooper 2165 in Herb. Kew!* near Stanger, *Wood in Govt. Herb. Natal 3433!* Natal and Zululand, *Gerrard 1588 in Herb. Kew!*

34. G. heterophylla, Loesen. in Engler Prantl Nat. Pflanzfam. iii, 5, 207.

Celastrus heterophylla, Eck. and Zeyh. *ex* Sond. *Fl. Cap.* i. *458* (*excl. var. glomeratus*); *C. cymosus 948 and* (*C. parvifolius 949*) Eck. and Zeyh. *l.c. names only*; *Catha heterophylla* and *C. cymosa*, Presl *Celastrus glomeratus*, *E. Mey. in Drège Zwei Pfl. Docum. 146* (*name only*).

A glabrous much-branched spiny shrub 2–3 feet high. *Branches* sub-angular, striated. *Spines* slender, reaching a length of about 1·5 cm. *Leaves* alternate, never fasciculate, sub-coriaceous, varying very much in size and shape even on the same branch; petiole 1–2 mm. long; lamina 0·8–3 cm. long, 0·4–2 cm. wide, elliptic to sub-orbicular, acute or obtuse, with an apiculate point, narrowed slightly at the base, with the veins distinct on the under surface and a sub-entire or spinuloso-serrate margin. *Inflorescence* cymose, sub-sessile, rather dense. *Pedicels* 1·5–2 mm. long; fruiting pedicels short and stout. *Flowers* 5-parted. *Sepals* 1 mm. long, sub-orbicular, with a laciniated margin. *Petals* 2·25 mm. long, broadly oblong, with an uneven undulate margin. *Filaments* 1·5 mm. long. *Disc* fleshy, annular, with a slightly crenulate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 0·25 0·5 mm. long; stigma obsoletely 3-lobed. *Fruit* a trigonous dry capsule about 5 mm. long. *Seed* covered with a thin yellow aril.

Coast Region: Gamtoos River, *Schlechter 6043 in Herb. Bolus!* Addow, Uitenhage, *Ecklon and Zeyher 949 in Herb. Musei. Austro. Afric.!* Addow, Uitenhage, Zwarthoogdens between Hassagaybosch and Grahamstown (Albany), *Ecklon and Zeyher 1948 in Herb. Kew!* and *in Herb. Musei Austro. Afric.!* Albany Dist., *Cooper 1523 in Herb. Kew!* Bothasberg (Albany), *Zeyher 16 in Herb. Musei Austro. Afric.!* Bosjemansrivier, *Zeyher 2181 in Herb. Musei Austro. Afric.!* among bushes on kloof about Grahamstown, *without Collector in Herb. Kew No. 94!* Kingwilliamstown, *Tyson 1049 in Herb. Musei Austro. Afric. 5524!* Between Gekau and Bashee River, Transkei, *Drège in Herb. Kew!*

35. G. buxifolia, Szysz. Enum. Polypet. Rehm. 2, 34 (1888).

Pegler Ann. Bolus Herb. ii, 13 (*name only*). *Cetastrus buxifolius*, *Linn. Sp. 285*; *Sond. in Harv. and Sond. Fl. Cap.* i. *459*; *Thunb. Prod. 42*; *Thunb. Fl. Cap. 220*; *Houtt. Pfl. Syst. 3 t. 21 f. 1*; *Catha buxifolia*, *Presl Bot. Bem*; *Celastrus rhombifolius E. and Z. Sond. in Harv. and Sond. Fl. Cap.* i. *460*, *var. genuinus*, *Sond. in Harv. and Sond. Fl. Cap.* i. *459*; *Celastrus cymosus Sol. Bot. Mag. 2070*, *spinis nudis*; *Celastrus multiflorus*, *Ecklon and Zeyher Enum. Plant. Afric. Austr. 951*, *spinis floriferis*, *var. laxiflorus*, *Sond. in Harv. and Sond. Fl. Cap.* i. *459*; *Celastrus patens* and *spathaephyllus*, *Ecklon and Zeyher l.c. 939*, *950*; *E. leptopus*, *Bernh. in Hb. Krauss*; *Catha patens* and *spathophylla*, *Presl.*, *var. venenatus*, *Sond. in Harv. and Sond. Fl. Cap.* i. *459*; *Celastrus venenatus*, *Ecklon and Zeyher*, *l.c. 952*; *Catha venenata*, *Presl*, *var. empleurifolius*, *Sond. in Harv. and Sond. Fl. Cap.* i. *459*; *Celastrus empleurifolius*, *Ecklon and Zeyher l.c. 953*, *fol. membranaceis*; *C. polyanthemos*, *Ecklon and Zeyher*, *l.c. 951*, *fol coriaceis*. *Celastrus buxifolius*, *humilis and parvicaulis*, *Ecklon and Zeyher Enum. Plant Afric Austr. 942*, *944*, *940*.

An extremely variable glabrous much-branched shrub, either almost spineless or bearing numerous strong spines reaching a length of 10 cm. *Branches* of two kinds; the long ones terete, not striated, with smooth greyish-white bark when young, becoming darker and fissured on the older branches; the short ones very abbreviated and bearing tufts of leaves and inflorescences. *Spines* very strong and often bearing leaves and inflorescences. *Leaves* alternate or tufted, sub-membranous or coriaceous, green or greenish-glaucous; petiole

2–6 mm. long; lamina 1·8–6 cm. long, seldom exceeding 6 cm., 0·6–2·5 cm. wide, always more than twice as long as broad, obovate or oblanceolate above the cuneate base, obtuse or emarginate, veiny on both sides, with a serrate or crenulate margin. *Inflorescence* cymose, borne usually on the short shoots, usually much branched, but varying very much in size and the number of flowers. *Peduncle* usually stout and varying from 0·2–1·5 cm. in length, absent in var. *glomeruliflora*. Fruiting pedicels usually much less than 5 mm. long. *Flowers* 5-parted. *Sepals* sub-orbicular, with laciniated margins; the 2 outer 0·5–1 mm. long; the 3 inner 1–1·5 mm. long. *Petals* 2·5–4 mm. long, elliptic or broadly oblong, with a ciliated margin. *Filaments* 2–2·5 mm. long, dilated at the base. *Disc* fleshy, annular, with a crenulate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style 0·25 mm. long; stigma obsoletely 3-lobed. *Fruit* a dry 3-locular capsule varying in size, usually the size of a small pea and very woody.

Coast Region: Olifant's River, Clanwilliam Div., *Dickson in Herb. Bolus 5609!* and *in Herb. Kew!* Tafelberg, Cape, *Ecklon and Zeyher 942 in Herb. Musei Austro. Afric.!*; Table Mountain, Cape of Good Hope, *John MacGillivray 616 in Herb. Kew!* Devil's Mt., Capetown, *Ecklon and Zeyher 945 in Herb. Musei Austro. Afric.!* Devil's Peak, near cataract, *Pappe in Herb. Musei Austro. Afric.!* Waterfall, Devil's Peak, *Wolley-Dod 1950 in Herb. Bolus!* and *in Herb. Kew!* Simon's Bay, *Milne 144 in Herb. Kew!* Cape of Good Hope, *Cooper 230 in Herb. Kew!* Elandskloof, Caledon, *Ecklon and Zeyher 951 in Herb. Musei. Austro Afric.!* in plains between Kockmanskloof and Gauritz River, Swellendam, *Ecklon and Zeyher 951 in Herb. Musei Austro. Afric.!* River banks near Congo, Oudtshoorn Dist., *Bolus in Herb. Bolus 11748!* Langekloof, George, *Ecklon and Zeyher 953 in Herb. Musei. Austro. Afric.!* *Mundo in Herb. Musei Austro. Afric.!* Seven Weeks Poort, Zwartbergen Mts., *Phillips 1418* and *in Herb. Musei Austro. Afric. 9155!* Banks of Keurboom River, Knysna Div., *Fourcade 1061 in Herb. Fourcade!* and *in Herb. Kew!* Knysna, *Schlechter 5896 in Herb. Bolus!* Hills below Assegai Bush and Essenbosch, Humansdorp Div., *Fourcade 1894 in Herb. Fourcade!* and *in Herb. Kew!* Humansdorp, *Rogers 2986 in Herb. Bolus!* Hills near Humansdorp, *Fourcade 1030 in Herb. Fourcade!* and *in Herb. Kew!* Hillsides, Humansdorp, *Galpin 3881 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Malabasshoogde and Hersguaskloof (Humansdorp) *Zeyher 2182 bis in Herb. Musei Austro. Afric.!* Zwartkops River, Uitenhage, *Ecklon and Zeyher 944 in Herb. Musei Austro. Afric.!* Zwartkops Uitenhage, *Zeyher 246 in Herb. Musei Austro. Afric.!* and *in Herb. Kew!* Zwartkops River, Uitenhage, *Ecklon and Zeyher 952 in Herb. Musei Austro. Afric.!* Gamtoos River, Uitenhage, *Ecklon and Zeyher 954 in Herb. Musei Austro. Afric.!* Krakakamma, Uitenhage, *Zeyher in Herb. Musei Austro. Afric.!* *Ecklon and Zeyher 940 in Herb. Musei Austro Afric.!* Uitenhage, Div., *I. L. Drège in Gort. Herb. Pretoria 8486!* and *in Herb. Kew!* Witteklip, Uitenhage, *Bolus in Herb. Bolus 9137!* Blaauw Krantz, Bathurst Div., *Burchell 5654 in Herb. Kew!* Blaauw Krantz, Zitzikamma, *Fourcade 1229 in Herb. Fourcade!* and *in Herb. Bolus!* coast forest, Storm's River, Zitzikamma, *Fourcade 381 in Herb. Kew!* in forest, Groot River, Zitzikamma, *Fourcade 653 in Herb. Fourcade!* and *in Herb. Kew!* near Grahamstown, *MacOwan 124 in Herb. Musei Austro. Afric.!* near Lesseyton Nek, Queenstown, *Galpin 2164 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Kingwilliamstown, *Sim 1962 in Herb. Bolus!* British Kaffraria, *Cooper 230 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Prospect Farm, hill-sides near woods near Komgha, *Flanagan 325 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric.!* and *in Herb. Kew!* Chumiesberg, Kafferland, *Ecklon and Zeyher 939 in Herb. Musei. Austro Afric.!* Kentani, *Pegler 58 in Herb. Bolus!* near Kentani, *Pegler 1207 in Herb. Bolus!*

Central Region: Zwarthilletje, Prince Albert Div., *Drège in Herb. Kew!* Prince Albert Div., *Drège in Herb. Kew!* between Zuurberg Range and Klein Bruintjes Hoogte, Somerset Div., *Drège in Herb. Kew!* Blyde River, Somerset Div., *Burchell 2962 in Herb. Kew!* Somerset Div., *Burchell 3113* and *3067 in Herb. Kew!* by watercourses, Graaff-Reinet, *in Herb. Bolus 26!* Nieuweveld, Beaufort West, *Drège in Herb. Kew!* Papkuil, *Wilman in Herb. Musei. Austro Afric. 25342!*

Western Region: Sandy river beds, Amiet, *Pearson 9853 in Herb. Kew!* among rocks near water in Kloms Ravine, Khamiesberg, *Pearson 6644 in Herb. Bolus!* and *in Herb. Kew!* roadside between Brakdam and Rietkloof, Namaqualand, *Pearson 5672 in Herb. Kew!*

Kalrhari Region: Near Griqualand, *Burchell 1703!* and *1705 in Herb. Kew!* Griqualand West, *Burchell 2632 in Herb. Kew!* Harrismith, Orange Free State, *Sankey 240 in Herb. Kew!* Bethlehem, *Potgieter 80 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Bethlehem, *Phillips 3154* and *in Nat. Herb. Pretoria 1121! and in Herb. Kew!* Schoonheid 170, in Bloemhof Dist., *Burtt-Davy 9406 in Transv. Herb.!* and *in Herb. Kew!* Leribe, Basutoland, *Dieterlen 6813 in Herb. Kew! 75b in Nat. Herb. Pretoria and in Herb. Kew!* and *in Govt. Herb. Natal 13861! 75a in Nat. Herb. Pretoria!* and *in Herb. Musei. Austro Afric. 6813!* and in *Herb. Kew!* Kookfontein, Vereeniging, *Burtt-Davy 15137 in Herb. Bolus!* Pretoria, *Wilms 219 in Herb. Kew!* Pretoria Kopjes, *Leendertz 186 in Herb. Bolus!* Irene *Rogers 11408 in Herb. Bolus!* and *in Herb. Kew!* Aapies Poort, Pretroia, *Rehmann 4080 and 4082 in Herb. Kew!* Wonderboom, about four miles from Pretoria, *Phillips 3030 in Nat. Herb. Pretoria!* and *in Herb. Musei. Austro. Afric 16864! and in Herb. Kew!* Matebe Valley, Transvaal, *Holub in Herb. Kew!* Struben's Farm, Lynwood, Pretoria Dist., *Mogg in Transv. Herb. 11482!* and *in Herb. Kew!* Daspoort, Pretoria Dist., *Burtt-Davy 1179 in Transv. Herb!* and *in Herb. Kew!* Rivers Creek, Barberton, *Galpin 515 in Herb. Bolus!* and *in Nat. Herb. Pretoria!* and *in Herb. Kew!* Sheba Valley, near Barberton, *Galpin 1104 in Herb. Bolus!* Springbok Flats, southern slopes of Nek, Waterberg Dist., *Burtt-Davy 1730* and *in Transv. Herb. 2729! and in Herb. Kew!* Mosdene, Naboomspruit, Waterberg Dist. *Galpin M 54 in Herb. Musei. Austro Afric. 19192!* Burns on rise between M'Kethlalegi Spruit and White M'Belusi, Swaziland, *Burtt-Davy 10631 in Transv. Herb!* and *in Herb. Kew!*

Eastern Region: Fort Donald, Griqualand East, *Sister Stephany 631 in Herb. Bolus!* Durban, Natal, *Wood 8299 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Around Durban, *Sanderson 414 in Herb. Kew!* Station Dumisa, Alexandra Dist., Natal, *Ruiatis 660 in Herb. Kew!* Verulam, Natal, *Wood 604 in Herb. Bolus!* and *in Herb. Kew!* Umzingati Falls, *Wood 11504 in Herb. Kew!* and *in Govt. Herb. Natal 12412!* Natal, *Wood in Herb. Kew! Gerrard 55 and 581 in Herb. Kew!* Inanda, Natal, *Wood 685 and 499 in Herb. Kew! Wood 685* and *in Col. Herb. Natal 5955!* Port Natal, *Gueinzius in Herb. Kew! Harvey in Herb. Kew!* around Durban, Natal, *Wood 69 in Herb. Kew!* coastland, Natal, *Sutherland in Herb. Kew!* Winklespruit, South Coast, Natal, *Franks in Govt. Herb. Natal 12987!* Pinetown, Natal, *Wood 8795 in Herb. Bolus!* Springfield, Natal, *Wood 12813* and *in Govt. Herb. Natal 15984!* Malvern, *Wood 10097* and *in Govt. Herb. Natal 10907!* Natal and Zululand, *Gerrard 1378 and 1379 in Herb. Kew!* roadside near Somkele Rail, Klabisa, *Aitken and Gale 24 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Ilala Veld, north of Mkuzi River, Ubombo, *Aitken and Gale 16 in Nat. Herb. Pretoria!* and in *Herb. Kew!* near edge of bush, E. Ingwavuma, *Aitken and Gale 54 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Entumani, Zululand, *Wood 9364 in Nat. Herb. Pretoria!* and *in Herb. Kew!* Skilouvane, *Junod 579 in Herb. Kew!*

Rhodesia: Suburbs, Bulawayo, *Zealley 18 in Herb. Bolus.*

Without Locality: *Wallich in Herb. Kew! Thom 155 and 184 and 113 in Herb. Kew! Alexander Prior in Herb. Kew! Zeyher 2179 and 304 in Herb. Kew! Gill in Herb. Kew! Baur in Herb. Marloth 8694! Gerrard and McKen in Govt. Herb. Natal 621!*

Sim, in "Forest and Forest Flora of Cape Colony," 186, says of this plant: "*Gymnosporia buxifolia* is abundant from Capetown eastward through all the conservancies, and from the coast up to 5,000 feet, seldom in dense forest, but seldom absent from the forest environs or from rocky scrub: it occurs also on Karroo kopjes and on the Drakensberg and other mountains, and extends to Natal and Transvaal."

This is an exceedingly variable species and also a very widespread one. It varies not only in the size of the plant but also in the size of the spines, leaves, inflorescence and

flowers. It is distinguished from *G. senegalensis* by the smaller and greener leaves. In *G. senegalensis* the leaves are glaucous to whitish and have a very finely-serrated margin, It is distinguished from the species preceding it in the key by the pronounced obovate leaves.

Sonder (" Flora Capensis " i, 459) describes four varieties, only one of which is retained, viz. *glomeruliflorus*. The differences are hardly distinguishable and the specimens merge into each other too much to warrant retaining these varieties.

G. buxifolia var. **glomeruliflora,** Davison, comb. nov.

Celastrus buxifolia var. glomeruliflora, Sond. in Harv. and Sond. Fl. Cap. i, *459.*

A glabrous almost unarmed shrub. *Inflorescence* much-branched, sub-sessile, dense and much shorter than the leaf.

Coast Region: Gametoos River, *Dr. Gill!*

36. G. senegalensis, Loesen. in Engl. Bot. Jahrb. 17 (1893), 541.

Celastrus senegalensis, Lam. Oliv. Fl. Trop. Afr. i, *361.*

A glabrous glaucous or glaucescent shrub, from 1–10–15 feet high, unarmed or spinous. *Branches* of two kinds; the long ones terete, whitish or greyish-white, with the bark smooth when young, fissured when older; the short branches very abbreviated, bearing tufts of leaves and inflorescences. *Spines* either short and slender or stout and reaching a length of 7–10 cm. *Leaves* alternate, rarely tufted on the short branches, coriaceous, very variable as to size; petiole 0·3-1 cm. long; lamina 2-10 cm. long, usually over 6 cm. long, 1·3–4·5 cm. wide, obovate or oblanceolate above the very cuneate base, rounded or subemarginate, sometimes sub-acute and mucronate, grey, glaucous to whitish, with distinct venation and very closely and finely serrate denticulate margins. *Inflorescence* cymose, solitary or fascicled, usually much branched and shorter than the leaves, fairly compact or lax. *Peduncle* 0·2-1·2 cm. long. *Fruiting pedicel* stout, usually less than 5 mm. long. *Flowers* 5-parted, varying in size. *Sepals* 0·25-0·5 mm. long, sub-orbicular, with a laciniated margin. *Petals* 1–3·5 mm. long, broadly oblong, distinctly veined, with a fimbriate undulate margin. *Filaments* extremely short or 1 mm. long. *Disc* fleshy, annular, with a crenulate margin. *Ovary* usuall 2-chambered, occasionally 3-chambered; style very short; stigma 2-lobed, occasionally 3-lobed. *Fruit* a dry capsule 4–5 mm. long.

Western Region: Erongo Mts., *Pearson 9853* and *in Herb. Musei. Austro Afric. 12041!* and *in Herb. Bolus!*

Kalahari Region: South African Gold Fields, *Baines in Herb. Kew!* Smit's Drift, *Pole Evans H. 15730 and H. 15732 in Herb. Kew!* In gullies around Barberton, *Galpin 514 in Herb. Bolus!* Pietpotgietersrust, Transvaal, *Leendertz 1286 in Herb. Bolus!* South side of the Limpopo above Peerie's Kraal, *Baines in Herb. Kew!* Between Delagoa Bay and Pretoria, *Bolus 7698 in Herb. Bolus and in Herb. Kew!*

Eastern Region: Lobito Bay, near Benguella, *Bolus in Herb. Bolus 12450!*; About fifteen miles from Lourenco Marques, Delagoa Bay, *Bolus 7699 in Nat. Herb. Pretoria!* and *in Herb. Bolus* and in *Herb. Kew!* Lourenco Marques, Delagoa Bay, *Bolus 7700 in Herb. Bolus!* and *in Herb. Kew!* About eighteen miles from Lourenco Marques, Delagoa Bay, *Bolus 7701 in Herb. Bolus!* and *in Herb. Kew!* Polana, Lourenco Marques, *Borle 14 in Nat. Herb. Pretoria!* Catembe, Lourenco Marques, *Borle 120 in Nat. Herb. Pretoria!*

Rhodesia: " The World's View." Matopo Hills, near Bulawayo, *Galpin 7077 in Nat. Herb. Pretoria!* and *in Herb. Bolus!* Matopos Hills, *Rogers 5244 in Herb. Bolus!* Main Street, Bulawayo, *Zealley 80 in Herb. Bolus!* Bulawayo, *Holte in Herb. Bolus 4359!* Islands near Victoria Falls, *Allen 411 in Nat. Herb. Pretoria!* Banks of the Zambesi, above the Falls, *Lamb 2406 in Herb. Bolus!* Livingstone, N. bank of Zambesi, N.W. Rhodesia, *Rogers 7420 in Herb. Bolus!* Vleiand N'dola, N.W. Rhodesia, *Allen 384 in Nat. Herb. Pretoria!* Odanzi River Valley, Div. Umtali, *Teague 32 in Herb. Bolus!* and *in Herb. Kew!* Lomagundi, Rhodesia, *Eyles 3148 in Herb. Musei. Austro Afric. 18531!* Salisbury,

Rhodesia, *Eyles 1655* and *in Herb. Musei. Austro Afric. 17529 ! 649* and *in Herb. Musei. Austro. Afric 11578 !* Chilanga, N. Rhodesia, *Rogers 8523* and *in Herb. Musei. Austro. Afric 8922 !* and *in Herb. Bolus !*

Probably *Gymnosporia sp.*

The material of this specimen is very scanty. From its general appearance and the structure of the flowers, I should place it as a *Gymnosporia*. There are not fruits, however, and the flowers are not quite mature, so for the present it would be safer not to place it definitely in the key. The following is a description of the specimen as far as the material goes :—

Twigs sub-angular, greyish-brown. *Leaves* alternate, coriaceous ; petiole 2–3 mm. long ; lamina 1·5–2·5 cm. long, 1–1·8 cm. wide, obovate or rounded obovate, cuneate, rounded or sub-actute, with serrate margins and distinct venation. *Inflorescence* faciculate : fascicles few-flowered and the flowers sub-sessile. *Flowers* 5-parted, immature. *Sepals* sub-orbicular, with a laciniated margin. *Petals* sub-orbicular. *Disc* saucer-like. *Ovary* 3-chambered. *Stigmas* 3, sub-sessile. *Fruit* not seen.

Kalahari Region : Transvaal, *Rehmann* 6518.

If, when further material is available, this is definitely placed as a *Gymnosporia*, it should be inserted in the key immediately after *G. undata*, Szysz., from which it may be distinguished by the leaves not exceeding 2·5 cm. in length and the inflorescence being few-flowered, with sub-sessile flowers while in *G. undata* the leaves are from 3–7 cm. long and the facicles are many-flowered, with the pedicels at least 0·5 cm. long.

2. PTEROCELASTRUS, Meissn.

Unarmed shrubs or trees with brownish-grey terete branches and angular twigs. *Leaves* alternate, coriaceous, petiolate, lanceolate, oblong-lanceolate, elliptic-lanceolate or obovate, obtusely-acuminate or obtuse, sometimes rugose on the under surface. *Inflorescence* a lax or dense-flowered cyme. *Flowers* 5-parted. *Sepals* unequal, with a laciniated margin. *Petals* often brown-flecked. *Disc* fleshy, obsoletely 5-lobed and half enveloping the ovary. *Ovary* 3-chambered, occasionally 2-chambered with 2 erect ovules in each chamber ; style terminal. *Fruit* a dry dehiscent capsule, with abrupt horns or wing-like outgrowths which may be variously divided.

Inflorescence a lax, much-branched cyme, up to about half as long as the leaves ; flowers fairly large ; leaves lanceolate or oblong-lanceolate, obtusely acuminate.
- Inflorescence 4–5 times dichotomously branched, few-flowered, compact ; peduncle 5–7 mm. long ; capsule with 3–6 simple abrupt horns ..... 1. *Galpinii.*
- Inflorescence many times branched, many-flowered, loose ; peduncle 1–2 cm. long ; capsule armed with numerous compressed, wing-like patent or decurrent horns ..... 2. *rostratus.*

Inflorescence a dense-flowered short cyme ; the flowers very small, with short stout pedicels ; leaves elliptic to obovate, rarely slightly acuminate.
- Leaves rather small, rarely up to 5 cm. long ; oblong-lanceolate to elliptic-lanceolate.
  - Leaves oblong-lanceolate not exceeding 1 cm. in width ; horns of fruit very short, not decurrent ..... 3. *Rehmannii.*
  - Leaves elliptic or oblanceolate, 1–2 cm. wide ..... 4. *echinatus.*
- Leaves usually well over 5 cm. long, obovate ..... 5. *tricuspidatus.*

1. P. Galpinii, Loes. in Engl. Bot. Jahrb. 41, 308 (1908), *Loesen. in Bull. Herb. Boiss. IV; 431.*

A shrub about 10 feet in height. The old branches terete, brownish-grey, with striated bark ; twigs alternate, angular. *Leaves* alternate, coriaceous ; petiole 3–5 mm. long ;

lamina 4·5–7 cm. long, 1–2·2 cm. wide; lanceolate, obtusely acuminate, mucronate, cuneate at the base, sometimes oblique, paler beneath, glabrous, with the margin entire, slightly revolute, and the midrib prominent on both surfaces: the lateral veins more prominent on the under surface and converging at the margin. *Inflorescence* a 4–5 times dichotomously branched few-flowered compact cyme up to about half as long as the leaves. *Peduncle* 5–7 mm. long. *Flowers* fairly large, 5-parted. *Sepals* unequal; 2 exterior 0·5 mm. long; 3 interior 1 mm. long. *Petals* 2·5 mm. long, oval or oblong-oval with irregular margins, pale yellow at the apex, speckled with brown in the centre from the base to about three-quarters of the way up. *Filaments* half as long as the petals, incurved. *Disc* fleshy, obsoletely 5-lobed, enveloping half the ovary and with the stamens inserted in the shallow sinuses. *Ovary* 2–3-chambered, with 2 ovules in each chamber; stigma sub-sessile shortly 2–3-lobed. *Fruit* a capsule, with 2–6 simple abrupt horns.

Kalahari Region: Rimer's Creek, Barberton. *Galpin 448 in Herb. Kew!* and in *Nat. Herb. Pretoria!* and in *Herb. Bolus!* Berlin, Kaapsche Hoop. *Hofmeyr 9 in Nat. Herb. Pretoria!*

2. P. rostratus, Walp. Rep. i, 535; *Sond. in Harv. and Sond. Fl. Cap.* i, *463.*

Celastrus rostratus, Thunb. Fl. Cap. ed. Schultz (1823) 218; Asterocarpus rostratus, Ecklon and Zeyher Enum. Pl. Afric. Austr. 963, p. 123; Pterocelastrus rostratus, Presl Bot. Bem.; Asterocarpus tricuspidatus, Ecklon and Zeyder Enum. Pl. Afric. Austr. 964, p. 124. excl. syn.

A tree 20 feet high, with diameter of 1–2 feet breast high. *Branches* terete, dark grey; twigs angular. *Leaves* alternate, coriaceous; petiole 5–7 mm. long; lamina 4·5–7·5 cm. long, 1·4–3·3 cm. wide, oblong-lanceolate, obtusely acuminate, emarginate, cuneate at the base, shining above, paler and dull beneath, glabrous, with the midrib raised on the upper surface, lateral veins more distinct on the under surface and converging at the margin. *Inflorescence* a many-times branched many-flowered loose cyme up to about half as long as the leaves. *Peduncle* 1–2 cm. long. *Flowers* fairly large, 5-parted. *Sepals* unequal: 2 outer 0·5 mm. long; 3 inner 2 mm. long, with the margins irregularly laciniated. *Petals* 3 mm. long, oblong, slightly clawed, with the margins slightly irregular at the apex, and the whole surface covered with brown striations. *Filaments* 0·75 mm. long. *Disc* fleshy, obsoletely 5-lobed, enveloping half the ovary, and with the stamens inserted in the shallow sinuses. *Ovary* 3-chambered, with 2 ovules in each chamber; stigma sub-sessile, with 3 flat lobes. *Fruit* a capsule, armed with numerous compressed wing-like patent or decurrent horns.

Coast Region: Stellenbosch, *Marloth in Herb. Marloth 5997!* Genadendal, Caledon Dist., *Ecklon and Zeyher in Herb. Kew!* "Brandenburg Forest," Zondereinde River, near Genadendal, *Gibbs in Herb. Bolus!* Grootvadersbosch, Swellendam, *Marloth in Herb. Marloth 3498!* Duyvelsbosch, Swellendam, *Ecklon and Zeyher 964 in Herb. Musei Austro. Afric.!* Langebergen, Swellendam, *Bolus 619 in Herb. Kew!* and in *Nat. Herb. Pretoria!* and in *Herb. Musei Austro. Afric.!* and in *Herb. Bolus!* *MacOwan 2967 in Herb. Musei Austro. Afric.!* Pupasvalley, Swellendam, *Ecklon and Zeyher 963 in Herb. Musei Austro. Afric.!* Grootvadersbosch, Swellendam, *Zeyher 2193 in Herb. Kew!* and in *Herb. Musei Austro. Afric.!* Mountains round Swellendam, *MacOwan 8823 in Herb. Musei Austro. Afric.!* Swellendam, *Mund in Herb. Musei Austro. Afric.!* Garcia's Pass, Riversdale Div., *Phillips 340 in Herb. Kew!* and in *Herb. Musei Austro. Afric.!* *Burchell 7433 in Herb. Kew!* George, *Burton in Herb. Forest Dept. No. 3776 in Nat. Herb. Pretoria!* Jonkersberg, George, *McMillan in Herb. Forest Dept. 3777* and *in Nat. Herb. Pretoria!* *Keet 1033 in Nat. Herb. Pretoria!*

3. P. Rehmannii, Davison. (Pl. XIII, Fig 2.)

Frutex glaber. *Rami* teretes, striati, suffuscicani. *Ramuli* angulares. *Folia* alterna, sub-coriacea; petiolus 2 mm. longus; lamina 2–3 cm. longa, 0·6–1 cm. lata, oblongo-

Plate XIII.

1. *Putterlickia verrucosa*, Szysz.
(Sim 1697.)

2. *Pterocelastrus Rehmannii*, Davison.
(Rehmann 6056.)

lanceolata, apice obtusa vel leviter emarginata, basi cuneato-acuta integribus marginibus, et conspicuis costis. *Cymae* parvae. *Pedunculus* 0·5 cm. longus, robustus. *Florae* non vidi. *Capsula* sicca, 0·5 cm. longa, brevis echinatibus numquam decurrentibus.

The material from which this species has been described is by no means ample. The type specimen was collected by Rehmann at Houtbosch in the Transvaal, and it is in the Kew Herbarium. It is quite evident though from the fruit that it is a *Pterocelastrus*, and both the fruit and the leaves point to the fact that it is a distinct species.

KALAHARI Region: Houtbosch, Transvaal, *Rehmann 6055 in Herb. Kew!*

4. P. echinatus, N.E.Br. in Kew. Bull. 1906, 16.

An entirely glabrous shrub, with terete brownish-grey branches. *Twigs* angular. *Leaves* alternate, coriaceous; petiole 1·5–3 mm. long; lamina 1·5–3 cm. long, 1·2 cm. wide, obovate or oblanceolate, obtuse or slightly emarginate, cuneately acute at the base, smooth and shining above, dull beneath, with the midrib and lateral veins more prominent on the under surface. *Inflorescence* a dense-flowered short cyme with small flowers and short stout pedicels. *Peduncle* as long as the flowering part, usually about 4 mm. long. *Flowers* 5-parted. *Sepals* 0·5 mm. long, orbicular, with laciniated brown-edged margins. *Petals* 2 mm. long, oblong. *Filaments* 1·5 mm. long. *Disc* fleshy, flat, obsoletely crenate. *Ovary* 3-chambered; each chamber 2-ovuled: style 1 mm. long; stigma obsoletely 3-lobed. *Fruit* a capsule covered with many (always more than three) horns.

KALAHARI REGION: M'babane, Swaziland, *Burtt-Davy 2791 in Herb. Kew*! and in *Herb. Bolus*!

EASTERN REGION: Maritzburg, *Rudatis 1599 in Herb. Kew!* Inanda, Natal, *Wood 1250! 1292! 582 in Herb. Kew!* Noodsberg, *Wood 4128 in Herb. Kew!* 'Nkomdhla, Zululand, *Haygarth in Herb. Wood No. 7538* and *in Herb. Kew!* and *in Col. Herb. No. 7538* and *in Herb. Bolus!* Ngoya, Zululand, *Medley Wood 8633 in Nat. Herb. Pretoria!* and in *Herb. Kew!*

5. P. tricuspidatus, Sond. in Harv. and Sond. Fl. Cap. i, 461.

Walp. Rep. (*1842*) i. *535; Burm. Afr. t. 97. f. 1. Celastrus tricuspidatus, Lam. Tabl. Encyc.* ii, *93; DC. Prod. 2. 5; Celastrus pterocarpus, in DC. Prod. 2. 5; Asterocarpus typicus, Ecklon and Zeyher, Enum. Pl. Afric. Austro. 956, p. 122; Pterocelastrus typicus, Meissn. Gen. pl. 68; Pappe Sylv. Cap. 9; Asterocarpus Burmanni, Ecklon and Zeyher Enum. Pl. Afric. Austro. 958, p. 122; Walp. Rep.* (*1842*) i, *535. Pterocelastrus variabilis, Sond. in Harv. and Sond. Fl. Cap.* i, *462; Asterocarpus nervosus, Ecklon and Zeyher Enum. Pl. Afric. Austro. 959, p. 123; Pterocelastrus nervosus, Walp. Rep.* i, *535; Asterocarpus arboreus, Ecklon and Zeyher Enum. Pl. Afric. Austr. 960 p. 123; Pterocelastrus arboreus, Walp. Rep.* i, *535; Asterocarpus tetrapterus, Ecklon and Zeyher Enum. Pl. Afric. Austr. 962, p. 123; Pterocelastrus tetrapterus, Walp. Rep.* i, *535. Pterocelastrus tetrapterus, Walp. Rep.* i, *535. Pterocelastrus litoralis, Walp. Rep.* i, *535; Asterocarpus litoralis, E. and Z. Enum. Plant. Austr. Afric. 957! Pterocelastrus stenopterus, Walp. Rep.* i, *535; Asterocarpus stenopterus, E. and Z. l.c. 961.*

A glabrous shrub or tree up to 20 feet high. *Branches* terete, with greyish-brown, striated bark; twigs angular. *Leaves* alternate, coriaceous; petiole 1·7 mm. long; lamina 3·5–8 cm. long (the majority 5 cm. or more long): 1·4 cm. wide, obovate, obtuse, slightly emarginate, cuneate at the base, glabrous, with the entire margins slightly revolute; the under surface of the leaf rugulose and having the midrib and lateral veins more prominent than on the upper surface. *Inflorescence* dense-flowered and short, with short stout pedicels. *Peduncle* 4–8 mm. long. *Flowers* 5-parted. *Sepals* unequal; 2 exterior 0·5 mm. long; 3 interior 1·5 mm. long, orbicular, brown-edged, and with slightly laciniated margins. *Petals* 2 mm. long, oblong, pale yellow throughout, with slightly irregular revolute margins. *Filaments* 1 mm. long; anthers small. *Disc* fleshy, surrounding the base of the ovary but not enveloping it, deeply 5-lobed, with the filaments situated in the deep sinuses. *Ovary* 3-chambered, with 2 ovules in each chamber; style 0·5 mm. long; stigma 3-lobed. *Fruit* a 3-winged capsule, with the wings entire, toothed, lacerated, bifid, or trifid.

I have included *P. tricuspidatus*, *P. variabilis*, *P. litoralis*, and *P. stenopterus* in one species under the name *P. tricuspidatus*. On examining all the material available it is quite clear that the variability in the species is due to the conditions under which the plant is growing, and not due to stable specific characters.

Coast Region: Malmesbury Div., Saldanha Bay, *Ecklon and Zeyher 958 in Herb. Musei. Austro Afric.!* Caledon Div., Hottentot Holland Mts., *Pappe in Herb. Musei Austro. Afric.!* Table Mt., *Burchell 267 in Herb. Kew! Ecklon and Zeyher 956 in Herb. Musei Austro. Afric.!* Diep River, *Marloth in Herb. Marloth 7178!* Muizenberg, *from Bolus Herbarium in Nat. Herb. Pretoria!* Muizenberg and Steenberg, *Zeyher 2195 in Herb. Musei Austro. Afric.!* Kalk Bay, *Bolus 4775 in Herb. Kew! and in Herb. Bolus!* Summit of Klein Slangkop, *Wolley-Dod 3086 in Herb. Bolus!* Simon's Bay, *Wright in Herb. Kew!* Cape Div., *Ecklon and Zeyher in Herb Kew! Bolus Herbarium in Nat. Herb. Pretoria!* Between Breede River and Duivenhoeks River, Swellendam, *Zeyher in Herb. Musei. Austro Afric.!* Grootvaderbosch and Wagonmachersbosch, Swellendam, *Ecklon and Zeyder 959 in Herb. Musei Austro. Afric.!* Grootvadersbosch, Swellendam Div., *Pearson 15543 in Herb. Bolus!* Zoetmelkfontein, Riversdale Dist., *Muir 5175 in Nat. Herb. Pretoria!* Mossel Bay, *Schlechter 5764 in Herb. Kew!* near Mossel Bay, *Young in Herb. Bolus 5513!* George, *Zeyher 306 in Herb. Kew! Drège 6727a in Herb. Kew!* Knysna, *Burchell 5235 and 5544 in Herb. Kew! Drège 6727b in Herb. Kew!* Zitzikamma, *Fourcahe 1381 and 1461 in Herb. Fourcade! Galpin 3884 in Nat. Herb. Pretoria!* Humansdorp, *Phillips 1553 and 1572 in Herb. Kew! 3324 and 3371 in Nat. Herb. Pretoria! Fourcade 2228 in Nat. Herb. Pretoria! Rogers 2984 in Herb. Bolus!* Uitenhage, *Ecklon 423 in Herb. Kew!* and in *Herb. Bolus! Alexander Prior in Herb. Kew! Ecklon and Zeyher 960 in Herb. Kew! Rogers 3609 in Herb. Kew!* Krakakamma and Adow, Uitenhage, *Ecklon and Zeyher 961 in Herb. Kew! and in Herb. Musei Austro. Afric.!* Walmer, Port Elizabeth, *Sim in Herb. Maritzburg Univ Coll. 1694!* Port Alfred, *Burchell 3921 and 4073 in Herb. Kew! Grey Coll. Herb. 212 in Herb. Bolus!* Port Elizabeth, *Ecklon and Zeyher 957 in Herb. Musei Austro. Afric.!* Zwartkopsrivier, *Pappe in Herb. Musei Austro. Afric.!* Van Staadensberg, *Zeyher 2196 in Herb. Musei Austro. Afric.!* Alexandria Div., *Burtt-Davy 14273 in Nat. Herb. Pretoria!* near Grahamstown, *MacOwan 1047 in Herb. Bolus!* Grahamstown, *Galpin 215 and 218 in Nat. Herb. Pretoria! Burtt-Davy 12171 in Nat. Herb. Pretoria! Burchell 3569 in Herb. Kew!* Atherstone, *Burchell 4918 in Herb. Kew!* Stockenstrom, *Stayner 103 in Nat. Herb. Pretoria!* Queenstown: *Herb. Galpin in Nat. Herb. Pretoria! Galpin 8089 in Nat. Herb. Pretoria! Cooper 283 in Herb Kew!* and in *Herb. Bolus!* on rocky ridges at Fincham's Nek, Queenstown, *Galpin 1889 in Nat. Herb. Pretoria!* Pirie *Sim in Herb. Maritzburg Univ. Coll. 1193!* Emerald Hill, South-eastern region, *Paterson in Herb. Bolus 1005!* Nahoon, East London, *Galpin 5739 in Nat. Herb. Pretoria!* Katriver, *Ecklon and Zeyher 962 in Herb. Musei Austro. Afric.!* Katberg, margins of forest and in open veld, *Stayner 103 in Herb. Bolus!* Komgha, *Flanagan 273 in Nat. Herb. Pretoria!* Kaffraria, *Baur 924 in Herb. Kew! Cooper 88 in Herb. Kew!* Fort Cunynghame, Kaffraria, *Sim 1920 in Nat. Herb. Pretoria! Sim 113 in Herb. Bolus!*

Central Region: Somerset, *Burchell 3314 in Herb. Kew!*

Eastern Region: Alexandra Dist., Natal, *H. Rudatis 1060 and 1129 in Herb. Kew!*

6. P. Dregeanus, Sond. in Harv. and Sond. Fl. Cap. i, 462.

Eleaodendron Dregeanum, Presl Bot. Bem.

A small glabrous much-branched shrub having a greyish-green appearance. *Branches* terete, striated, greyish; twigs angular, spreading. *Leaves* alternate, coriaceous; petiole 1–1·5 mm. long; lamina 1·5–2 cm. long, 0·5–0·9 cm. wide ovate or oblong-ovate, broadest in the middle and narrowed towards each end, obtuse, sometimes slightly emarginate, narrowed at base, thick and veinless, with a striato-rugulose and papilose-multi-punctate under surface, and smooth and shining upper surface. *Inflorescence* cymose. *Peduncle* 0·3–0·5 cm. long. *Flowers* 5-parted. *Sepals* unequal; 2 outer 1 mm. long; 3 inner 1·5 mm.

long, all sub-orbicular with laciniated margins. *Petals* 2·5 mm. long, sub-orbicular, concave with entire margins. *Filaments* 1 mm. long. *Disc* fleshy, saucer-like, with a crenulate margin. *Ovary* 3-chambered, with 2 ovules in each chamber; style very short; stigmas 3. *Fruits* not seen.

Coast Region: Wupperthal, Clanwilliam, *Drège 6725 in Herb Kew!* and *in Herb. Musei Austro. Afric!*

This species has not been inserted in the key as the fruits have not been seen, and, therefore, one cannot assert positively that it is a *Pterocelastrus*. It is readily recognized by the thick, veinless striato-rugulose leaves which have numerous white dots over the whole under surface. If the fruits, when seen, prove this to be a *Pterocelastrus* it should be inserted in the key between *P. Rehmannii* and *P. echinatus*. It can readily be distinguished from both species by the leaf characters stated above.

3. CASSINE. Linn.

Unarmed trees or shrubs, sometimes twining. *Branches* terete; twigs usually angular, sometimes slightly winged. *Leaves* opposite or alternate, petiolate, coriaceous. *Inflorescence* cymose. *Flowers* 4–5-parted. *Sepals* usually fleshy, with laciniated margins. *Petals* larger than the sepals, oblong or sub-orbicular. *Disc* fleshy, collar-like, saucer-shaped or flat, either surrounding the base of the ovary or half-enveloping it. *Ovary* 2–3-chambered, with two axile erect endospermous ovules in each chamber; style usually very short; stigma either entire or 2–3-parted. *Fruit* a drupe. *Seeds* without an aril.

1. Leaves alternate:
   - *a.* Flowers fasciculate; leaves entire or sub-entire:
     - *b.* Leaves rounded or obtuse at the apex ..... 1. *eucleaeformis.*
     - *bb.* Leaves acute ..... 2. *maritimum.*
   - *aa.* Flowers cymose; leaves serrate or crenate, rarely sub-entire:
     - *c.* Branchlets and under surface of leaves pubescent:
       - *d.* Leaves elliptic to orbicular, rounded at base; flowers several in cymes:
         - *e.* Cymes long-stalked, 1 or more cm. long; leaves about 6–8 cm. long, often distinctly toothed (coast region) ..... 3. *velutinum.*
         - *ee.* Leaves less than 4 cm. long, with a distinctly dentate-serrate margin; peduncle less than 1 cm. long (coast region) ..... 4. *pubescens.*
         - *eee.* Cymes very shortly stalked; leaves rarely as much as 4 cm. long, mostly sub-entire (Transvaal) ..... 5. *burkeana.*
       - *dd.* Leaves oblanceolate, cuneate at the base ..... 6. *Schlechteri.*
     - *cc.* Branchlets and under surface of leaves glabrous:
       - *g.* Inflorescence fairly long-stalked, 0·5–1·5 cm. long, glabrous or nearly so; leaves sub-cordate at base, usually nearly as long as broad ..... 7. *sphaerophylla.*
       - *ggg.* Inflorescence very shortly stalked, about 1–3 cm. long, not exceeding 3 mm. in length, pubescent; leaves cuneate at base, always longer than broad 8. *aethiopica.*

2. Leaves opposite:
   - *a.* Leaves entire ..... 9. *parvifolia.*
   - *aa.* Leaves serrate:
     - *d.* Leaves rounded at base; twigs distinctly 4-winged; leaves oblong-lanceolate or ovate ..... 10. *tetragona*, var. *lata.*
     - *dd.* Leaves rounded or sub-cordate at base; twigs 4-angled but never winged; leaves broadly ovate or sub-rotund 11. *latifolia.*

bb. Erect shrubs or trees ; twigs usually terete but if sub-angular never winged :
e. Leaves more or less obicular, very rounded at the base (Cape districts) ..... 12. *capense.*
ee. Leaves obovate or elliptic, obtusely or acutely cuneate at the base (south-eastern districts) :
* Mature leaves up to but usually less than 5 cm. long.
g. Fruits ellipsoid, slightly over 0·5 cm. long..... 13. *kraussiana.*
gg. Fruits globose, 1·5 or more cm. in diameter..... 14. *croceum.*
* Mature leaves usually over 6 cm. long.
h. Flowers pedicellate ; leaf margins distinctly spinuloso-serrate..... 15. *papillosa.*
hh. Flowers sub-sessile ; leaf margins minutely denticulated..... 16. *laurifolium.*

1. C. eucleaeformis, O. Ktze., Revisio Gen. Plant (1891) 114.

Mystroxylon eucleaeforme, Sond. in Harv. and Sond. Fl. Cap. 1, 470, Ecklon and Zeyher Enum. Plant Afric. Austr. 972, 125 ; M. filiforme, Ecklon and Zeyher l.c. 970, 125 ; M. oligocarpum, Ecklon and Zeyher l.c. 125 ; Celastrus filiformis. Thunb. Prod. (1794) 42 ; Fl. Cap. ed. Schultz (1823), 217.

A glabrous unarmed tree reaching a height of 40 feet and a diameter of 8 inches breast high. *Branches* greyish-brown, with an irregularly striated bark ; twigs angular. *Leaves* alternate, coriaceous ; petiole 2–5 mm. long ; lamina 2·5–4 cm. long, 1–2·5 cm. wide, oval or ovate, rounded or obtuse, cuneate at the base, dark green and shining above, paler and sometimes rugose beneath, with a slightly undulate and usually entire revolute margin, sometimes distinctly serrated. *Inflorescence* fasciculate. *Pedicels* 1–3 mm. long. *Flowers* 5-parted. *Sepals* 1 mm. long, sub-orbicular, with a laciniated margin. *Petals* 2·5 mm. long, oblong, with a ciliated margin. *Filaments* 1·5 mm. long. *Disc* saucer-like, with a crenated margin surrounding the base of the ovary but not enveloping it. *Ovary* 2-chambered, with 2 ovules in each chamber ; stigma sub-sessile, 2-lobed. *Fruit* a drupe the size of a small pea. The unfertile fruits are small and dry, but the fertile fruits are fleshy.

Coast Region : Knysna, *Burchell 5538 in Herb. Kew ! Fourcade 1902 in Nat. Herb. Pretoria ! Keet 707, 708, 709 in Nat. Herb. Pretoria ! Keet in Herb. Forest Dept. No. 3818, 3808,* and *in Nat. Herb. Pretoria !* Zitzitkamma, George, *Ecklon and Zeyher 970 in Herb. Musei Austro. Afric. !* Humansdorp, *Fourcade 1452 in Herb. Musei Austro. Afric. !* Uitenhage, *Ecklon and Zeyher 971, 972 in Herb. Kew !* and *in Herb. Musei Austro. Afric. !* Krakakamma, Uitenhage, *Ecklon and Zeyher in Herb. Musei Austro. Afric. !*

Kalahari Region : Woodbush, Transvaal, *O'Connor 10222 in Herb. Kew !*

Eastern Region : Egossa, E. Pondoland, *Sim 2469 in Herb. Maritzburg Univ. Coll. 1662 !* Natal, *Gerrard 1157 in Herb. Kew !* Ngaya, Zululand, *Wood 7541 in Herb. Kew ! Wood 8502, 9403 in Nat. Herb. Pretoria !* and *10165 in Nat. Herb. Pretoria !* and in *Herb. Bolus !*

Locality Unreadable : *Ecklon and Zeyher in Herb. Kew !*

2. C. maritimum, L. Bolus in Ann. Bolus Herb. i (1915), 182.

Celastrus maritimus, Bolus Journ. Linn. Soc. 24, 173 (1887) ; C. apiculatus, Sond. Mss. Gymnosproia apiculata, Sim in Forest and Forest Fl. Cape Col. (1907) 187. Gymnosporia maritima, Sim l.c. 186.

A glabrous unarmed scrambling shrub, about 2–3 feet in height, found growing along the seashore. *Branches* terete, greyish-brown ; twigs angular. *Leaves* alternate, coriaceous ; petiole stout, 1·5–3 mm. long ; lamina 1·5–4 cm. long ; 0·8–1·8 cm. wide, elliptic or ovate, sometimes apiculate, cuneate at the base, somewhat rugose, with the mid-rib prominent on the upper surface and with a reflexed entire margin. *Inflorescence*

fasciculate. *Pedicels* declinate, 2 mm. long in the flower, sometimes lengthening to 5 mm. in the fruit. *Flowers* 5-parted. *Sepals* unequal, all fleshy, concave, sub-orbicular, with laciniated margins and covered on the outer surface with a white powder ; 2 outer 1 mm. long ; 3 inner 1·5 mm. long. *Petals* 2 mm. long, obovate-oblong, with an undulate repando-crenate margin. *Filaments* 0·175 mm. long ; anthers 0·25 mm. long. *Disc* 5-lobed, fleshy, surrounding the base of the ovary, with the filaments situated in the sinuses. *Ovary* 2-chambered, with 2 erect ovules in each chamber ; style 0·25 mm. long ; stigma 2-lobed. *Fruit* a drupe the size of a small pea. *Seeds* without an aril.

Coast Region : Muizenberg, Cape Peninsula, *Caporn in Herb. Bolus !* Muizenberg Mts., near Fish Hoek Bay, *Bolus 4767 in Herb. Kew !* and *in Herb. Bolus !* Kalk Bay, next to seashore, *Bolus 307 in Herb. Kew !* and *in Herb. Musei Austro. Afric. !* and in *Herb. Bolus !* Knysna sand dunes, Groot River, *Fourcade 1978 in Herb. Fourcade !* and in *Herb. Bolus !* Plettenberg Bay. sand hills near the landing place, *Burchell 5320 in Herb. Kew !* Humansdorp, sand-dunes, Slang River, *Fourcade 1813 in Herb. Fourcade !* and in *Herb. Bolus !* Humansdorp, *Rogers 2993 in Herb. Kew !* Port Elizabeth, *Hemsley 217 in Herb. Albany Museum ! MacOwan No. 215 in Herb. Kew !* and in *Herb. Musei Austro. Afric. !* Schoenmakers Kop, near Port Elizabeth, *Paterson 2287 in Herb. Bolus !* Port Alfred, in bush near foreshore, *Tyson in Govt. Herb. Pretoria 13420 !* Port Alfred, near Grahamstown, *Burtt-Davy in Herb. Bolus 7858 !* Klynemund in Albany, *MacOwan 1402 in Herb. Musei Austro. Afric. !* East London, on sea coast, *Galpin 1847 in Nat. Herb. Pretoria !* and in *Herb. Bolus !* Sand-dunes, East London, *Sim 2343 in Herb. Bolus ! in Nat. Herb. Pretoria !*

No Locality : *Bowker in Herb. Kew.*

3. C. velutinum, Loes. Pegler in Ann. Bolus Herb. ii, 13 (name only).

Elaesdendron velutinum, Harv. in Thes. Cap. (1863), ii, 55, pl. 186. E. sphaerophyllum **var.** *pubescens, N.E. Br. in Gard. Chron. (1891), 393.*

A large forest shrub, 6–10 feet high, with a dense velvety pubescence covering the twigs, peduncles, and the under surface of the leaves. *Branches* terete, covered with a greyish bark ; twigs sub-terete, flexuous, and covered with a dense velvety pubescence. *Leaves* alternate, coriaceous ; petiole 3–6 mm. long, densely pubescent ; lamina 6–8 cm. long, sometimes a length of 10 cm., 2·5–4·5 cm. wide, sometimes reaching a width of 6 cm., elliptic or oblong-elliptic, obtuse, sometimes sub-emarginate, rounded or sub-cordate at the base, sparsely pubescent above, with the midrib only densely pubescent and the under surface of the leaf covered with a dense velvety pubescence ; the margin often distinctly toothed. *Inflorescence* a many-flowered crowded cyme. *Peduncel* 1–1·6 cm. long, densely pubescent. *Flowers* 5-parted. *Sepals* 1·5 mm. long, oblong, densely pubescent, and with brown-edged laciniate margins. *Petals* 2 mm. long, glabrous, broadly ovate, and with an irregular undulate margins. *Filaments* 1 mm. long. *Disc* 5-angled, fleshy, furrowed, with the filaments situated at the points. *Ovary* half enveloped by the flesh disc, 3-chambered, with 2 ovules in each chamber ; style entire, truncate ; stigma 0·25 mm. long. *Fruit* a drupe about 1 cm. long.

Coast Region : Knysna, *Burchell 5219 in Albany Museum Herb. ! ;* (?) Lottering Bush, Zitzikamma, *Galpin 3880 in Nat. Herb. Pretoria !* (?) Bathurst, *Burchell 3737 in Herb. Kew !* East London, *Galpin 7774 in Nat. Herb. Pretoria !* Kei Mouth, *Flanagan 1345 in Herb. Bolus !* and *in Herb. Musei Austro. Afric. !* and *in Nat. Herb. Pretoria !* Kentani, *Pegler 713 in Nat. Herb. Pretoria !* and in *Herb. Kew !* and in *Herb. Bolus !*

Central Region : Somerset Div., *Drège 6757a in Herb. Kew !*

Eastern Region : Inanda, Natal, *Wood 994 in Nat. Herb. Pretoria !* and in *Natal Govt. Herb. 1674 !* and in *Herb. Kew !* and in *Herb. Bolus !* Nonoti River, Natal, *Gerrard 1381 in Herb. Kew* ; Umzinyati, Natal, *Wood 11, 438 in Herb. Bolus !* and in *Herb. Musei Austro. Afric.*

4. C. pubescens, Kuntze, Rev. Gen., 1 (1891), 114.

Mystroxylon pubescens, Ecklon and Zeyher Enum. Plant Austr. Afric. 977 ; Sond in Harv. and Sond. Fl. Cap. i, *470.*

An unarmed tree 15–20 feet high. *Branches* terete, greyish-brown ; twigs terete, softly pubescent. *Leaves* alternate, coriaceous ; petiole 2–5 mm. long ; lamina 2–3·2 cm. long, 1·4–2·8 cm. wide, elliptic or orbicular, emarginate, rounded or sub-cordate, veiny, glabrous above, softly and densely pubescent beneath, with a dentate-serrate recurved margin. *Inflorescence* a few-flowered cyme. *Peduncle* 5 mm. long, glabrous or nearly so. *Pedicels* 3 mm. long. *Flowers* not seen. *Fruit* an ovate or obovate drupe.

Coast Region : Zwartkops River, Uitenhage Div., *Ecklon and Zeyher 977 ! Zeyher 2200 in Herb. Musei Austro. Afric. !*

5. C. Burkeana, Kuntze, Rev. Gen. (1891) 114.

Mystroxylon Burkeanum Sond. Fl. Cap. i, *470 ; Elaeodendron Rehmannii Szysz. En. Polypet. Rehm. 2, 37. E. aethiopicum, Oliv. var. pubescens. Fl. Trop. Afric.* i, *365 ; Mystroxylon aethiopicum. Thunb. according to Loesenes Nachträge.*

Branches terete, covered with short grey pubescent hairs ; twigs sub-terete, horizontal, covered with short soft grey pubescent hairs. *Leaves* alternate, coriaceous ; petiole 1–2 mm. long ; lamina 1·5–4 cm. long, 1–2 cm wide, ellipitic or oblong-elliptic, emarginate, rounded at the base, dark green and sparsely pubescent above, paler and more densely pubescent beneath especially on the prominent midrib, and along the revolute, sub-entire sometimes serrate margin. *Inflorescence* a pubescent few-flowered cyme. *Peduncle* very short and stout, not exceeding 2 mm., pubescent. *Flowers* 5-parted. *Sepals* 1 mm. long, pubescent, triangular, with brown-edged laciniate margins. *Petals* glabrous, 2 mm. long, sub-orbicular, with an irregular margin. *Filaments* 1 mm. long. *Disc* fleshy, furrowed, 5-angled, with the filaments situated at the points of the disc. *Ovary* half immersed in the fleshy disc, 3-chambered, with 2 ovules in each chamber ; style very short ; stigma capitate. *Fruit* a drupe the size of a pea.

Kalahari Region : Braamfontein, Johannesburg, *Gilfillan in Herb. Galpin 1699 !* Aapies Poort, *Rehmann 4099 in Herb. Kew ! 4100 in Herb. Bolus !* Pretoria, *Leendertz 461 ! 634 in Herb. Transv. Mus. !* road to Silverton, east of Goevrnment House, Pretoria, *Robertson in Herb. For. Dept. 2295 !* Crocodile River, *Burke 378 in Herb. Kew !* and in *Herb. Musei Austro. Afric. ! Zeyher 309 in Herb. Kew !* and in *Herb. Musei Austro. Afric. !*

Rhodesia : Salisbury, *Eyles 885 in Herb. Bolus !* and in *Herb. Musei Austro. Afric. !*

6. C. Schlechteri, Davison comb. nov.

Mystroxylon Schlechteri, Loes. in Engl. Bot. Jahrb. 28 (1901) 159.

The young branches, petioles, under surface of the leaf especially the midrib, peduncles and pedicels and calyx covered with a soft short grey pubescence ; the older branches gradually becoming glabrous. *Leaves* alternate, coriaceous ; petiole 2–3 mm. long ; lamina 3–5 cm. long, 0·8–1·7 cm. wide, oblanceolate or oblong, obtuse and minutely apiculate, rarely sub-acute, cuneate at the base, with the upper surface of the leaf glabrous except at the base of the midrib, which is sparsely pubescent, and with the undersurface sparsely pubescent but puberulous along the raised midrib ; margin sub-denticulate or serrulate, *Flowers* mostly solitary, small and sub-sessile, 5-parted. *Sepals* 0·75 long, ovate, obtuse, pubescent, with brown-edged laciniate margins. *Petals* 1·25 mm. long, sub-orbicular, glabrous. *Filaments* 0·5 mm. long. *Disc* fleshy, 5-angled, with the filaments situated at the points. *Ovary* half-enveloped by the disc, 3-chambered, with 2 ovules in each chamber ; style very short ; stigma capitate.

Ressano Garcia : *Schlechter 11944 in Nat. Herb. Pretoria ! and in Herb. Bolus !*

7. C. sphaerophylla, O. Kuntze Rev. Gen. Plant i, 114. (Pl. XI, Fig. 1.)

Mystroxylon sphaerophyllum, Ecklon and Zeyher Enum. Plant. Austr. Afric. 126 ; Sond. in Harv. and Sond. Fl. Cap. i, *470 ; Pappe Silva Cap. No. 31. Elaeodendron sphaerophyllum, Presl Sim in Forests and Forest Fl. Cape Col. (1907),* 191.

A tree 20–30 feet high and 18–24 inches diameter breast high. *Branches* terete, brownish-grey, glabrous ; twigs glabrous, somewhat compressed and angular. *Leaves* alternate, coriaceous ; petiole 2–5 mm. long ; lamina 1·5–5 cm. long, 1·2–4 cm. wide, elliptic or sub-orbicular, usually nearly as long as broad, emarginate, rounded or sub-cordate at base, glabrous on both surfaces, with a reflexed crenulate or callous-serrulate margin and raised veins on the under surface. *Inflorescence* a many-flowered cyme, glabrous or nearly so. *Peduncle* 0·5–1·5 cm. long, usually measuring up to 1 cm. long, glabrous or nearly so. *Flowers* 5-parted. *Sepals* 1–1·5 mm. long, with ciliated margins. *Petals* 2 mm. long, sub-orbicular, with irregular undulate margins. *Filaments* 1·5 mm. long. *Disc.* fleshy, 5-angled, with the filaments situated at the points. *Ovary* half-enveloped by the disc, 3-chambered, with 2 erect ovules in each chamber ; style 5 mm. long ; stigmas 2. *Fruit* a drupe the size of a pea.

Coast Region : Duivenhok, Swellendam, *Zeyher in Herb. Musei Austro. Afric. !* Knysna, *Keet in Herb. Forest Dept. 2528 ! 2751 ! 2752 ! 3079 ! Burchell 5639* and *5624 in Herb. Kew ! Pappe in Herb. Kew !* and in *Herb. Musei Austro. Afric. ! Rogers 26085 in Herb. Kew ! Duthie 608 in Herb. Bolus !* Sand hills east of Keurbooms River, Knysna Div., *Fourcade 1074 in Herb. Bolus !* Plettenberg Bay, *Fourcade 613 in Herb. Fourcade !* Humansdorp, *Fourcade 2146 in Herb. Fourcade ! Uitenhage, Alexander Prior in Herb. Kew !* " Cap Recief " and Kiakakamma (Uitenhage), *Ecklon and Zeyher 978 in Herb. Musei Austro. Afric. !* Forests of Addo and by Zwartkops River, Uitenhage, *Zeyher 632 in Herb. Musei Austro. Afric. !* Port Alfred, *Tyson in Herb. Transv. Mus. 17529 !* Port Alfred, near Grahamstown, *Burtt-Davy 7931 in Herb. Bolus !* Zwartkoprivier *Zeyher, 2200 in Herb. Musei Austro. Afric. ! Kowie, MacOwan 417 in Herb. Kew ! and in Herb. Gill. Coll !* Hillary, near sandflats, Alexandria Dist., *Burtt-Davy 14281 in Herb. Bolus !* Philippstown, Katrivier, *Ecklon and Zeyher 976 in Herb. Musei Austro. Afric. !* hillside near junction of the Kei Rivers, Queenstown Dist., *Galpin 8091 in Herb. Albany Mus !* Gooda River Mouth, East London, *Galpin 7337 in Herb. Albany Mus. !* and in *Nat. Herb. Pretoria !* and in *Herb. Kew !*

No Locality : *Muller in Herb. Kew !*

8. C. oethiopica, Thunb. in Fl. Cap. ed. Schultz (1823), 269.

Mystroxylon confertiflorum, Sond. in Harv. and Sond. Fl. Cap. i, *469 ; Elaeodendron aethiopicum, Oliver Fl. Trop. Afr.* i, *365 ; Sim Forests and For. Fl. Cape Col. (1907) ; E. anthranthum, Presl Bot. Bemerk 34 : M. Kuhu, Ecklon anh Zeyher Enum. Plant Austr. Afric. 127 ; M. athranthum, M. spilocarpum, M. sessiliflorum, Ecklon and Zeyher l.c. 973, 974, 975. M. confertiflorum,* Tulasn, Ann. Sc. Nat. (1871) Bot. 106.

A shrub or tree reaching a height of 20–30 feet, with a diameter up to 12 inches breast high. *Branches* terete, greyish-brown ; twigs sub-angular, slightly pubescent or glabrous. *Leaves* alternate, coriaceous ; petiole 1–4 mm. long ; lamina 1–2·4·5 cm. long, 0·8–2·5 cm. wide, oblong or elliptic-oblong, obtuse, always longer than broad, shallowly emarginate, usually cuneate at the base, glabrous or sparingly pubescent on the under surface, with a reflexed crenulate sometimes slightly undulate margin and prominent veins on the under surface. *Inflorescence* a dense cyme, pubescent. *Peduncle* very short, not exceeding 3 mm. *Flowers* 5-parted. *Sepals* 0·75 mm. long, sub-orbicular, pubescent, with brown-edged fimbriate margins. *Petals* 2·5 mm. long, oblong, with irregular undulate margins. *Filaments* 0·75 mm. long. *Disc* fleshy, furrowed with a crenulate margin. *Ovary* partly enveloped by the disc, 2-chambered, with 2 ovules in each chamber ; style 0·5 mm. long ; stigma capitate. *Fruit* a drupe the size of a pea.

Coast Region : Knysna, *Keet in Herb. Forest Dept. 2335 ! Fourcade 1059 !* Uitenhage, *Ecklon and Zeyher ! Drège 6736a ! Ecklon and Zeyher 975 ! Alexander Prior !* Addo Forests, Uitenhage, *Ecklon and Zeyher 973 ! 974 !* Redhouse, Uitenhage, *Paterson in Herb. Rogers 495 !* Grahamstown, *Galpin 263 !* Kanagha, Albany, *Galpin 175 !* Albany, *Hutton !* Katberg, *Ecklon and Zeyher !* Kat River, *Ecklon and Zeyher 976 !* Queenstown, *Galpin 8091 ! 8261 !* East London, *Wood 3373 ! Paetzold 8223 !* Komgha, *Flanagan 308 !*

Central Region : Somerset East, *Burchell 3172 ! 5188 ! 3285 ! Drège 6737a !*

Eastern Region : Natal, *Gerrard 690 !*

No Locality : *Pappe ! Alexander Prior !*

2. C. parvifolia, Sond. in Harv. and Sond. Fl. Cap. i, 466.

A small glabrous shrub with terete brownish-purple branches. *Twigs* angular. *Leaves* opposite, coriaceous ; petiole stout 3–5 mm. long ; lamina 3–6 cm. long, 0·7 2·5 cm. wide, lanceolate or oval, obtuse, emarginate, sometimes slightly apiculate, with a very cuneated base, slightly rugose, with a thick midrib, with prominent veins on the under surface and with an entire reflexed margin. *Inflorescence* a few-flowered cyme with a prominent bract at the base of each flower. *Bract* very acuminate, 2·5 mm. long, with laciniated margins. *Penduncle* short, 2–4 mm. long. *Flowers* 5-parted. *Sepals* 0·75 mm. long, triangular, with laciniated margins. *Petals* 1·75–2·5 mm. long, oblong, with a slightly irregular margin and distinct brown veins. *Filaments* 0·5 mm. long. *Disc* not very conspicuous, forming a narrow collar round the base of the ovary. *Ovary* 2-chambered, with 2 ovules in each chamber ; style 0·5 mm. long ; stigmas 2, bifid. *Fruit* not seen.

Coast Region : Witsenberg, *Zeyher in Herb. Musei Austr. Afric. !* Witsenberg, near Steendahl, *Bolus 5478 in Herb. Kew !* and *in Herb. Musei Austro. Afric. !* and *in Nat. Herb. Pretoria !* Witte Els Bosch, Humansdorp Div., *Fourcade 823 in Herb. Bolus !* Zitzikamma, *Galpin 3883 in Nat. Herb. Pretoria !* and in *Herb. Maritzburg Univ. Coll. 1708 ! Fourcade 823 in Herb. Fourcade !*

10. C. tetragona, Loesen. in Engl. Bot. Jahrb. 28, 158.

Cassine scandens Ecklon and Zeyher Enum. Plant Austr. Afric. 989, 128 ; Sond. in Harv. and Sond. Fl. Cap. i. *467 ; Celastrus refractus, E. Mey in Drège Zwei. Pfl. Docum. 127 ex Sond. in Harv. and Sond. Fl. Cap.* i. *467 ; Celastrus tetragonus, Thunb. Prod. 42 ; E. Mey in DC. Prod.* ii, *7 (name only) ; Rhamnus tetragonus, Thunb. Fl. Cap. 146 exd. sp. fructif.*

A large climbing shrub. *Branches* flexuous, grey, more or less angled, twigs distinctly 4–6 winged. *Leaves* opposite, coriaceous ; petiole very short, 1 2 mm. long ; lamina 1·5–5·5 cm. long, 0·7–2·7 cm. wide ; the upper are smaller and narrower ; the lower larger and wider, oblong-lanceolate or ovate, obtuse or acute, nearly always apiculate, narrowed to the base and rounded or sub-cordate, glaucous with a revolute undulate usually spinulososerrate margin and the veins raised on the upper surface. *Inflorescence* a fairly dense cyme. *Peduncle* not exceeding 1 cm. *Pedicels* short, about 1 mm. long. *Flowers* 5-parted. *Sepals* 2 mm. long, sub-orbicular, with laciniated margins. *Petals* 2 mm. long, oblong, with slightly irregular margins. *Filaments* 0·25 mm. long. *Disc* narrow, cupular. *Ovary* 2-chambered, with 2 ovules in each chamber, not immersed in the disc ; style 0·25 mm. long ; stigmas 2, bifid. *Fruit* a drupe the size of a pea.

Var. *laxa* Loesen.

Leaves measuring up to 8·5 cm long. *Inflorescence* much laxer. *Peduncle* 1 1·3 cm. long. *Pedicels* 2 mm. long.

Coast Region : Knysna, *Burchell 5604 in Herb. Kew ! Rogers 26995 in Herb. Kew !* Uitenhage, *Ecklon and Zeyher in Nat. Herb. Pretoria !* and in *Herb. Musei Austro. Afric. ! Alexander Prior in Herb. Kew !* Galgebosch, *Drège in Herb. Musei Austro. Afric. !* and in *Herb. Kew !* Humansdorp, *Rogers 2949 in Herb. Albany Museum !* Zwartskopsrivier, Addo (Uitenhage), *Ecklon and Zeyher 989 in Herb. Musei Austro. Afric. !* and in *Herb. Kew !* and in *Herb. Bolus !* Redhouse, near Port Elizabeth, *Paterson 459 in Herb. Bolus !*

and in *Herb. Albany Mus.!* Port Elizabeth, *Alexander Prior in Herb. Kew!* Algoa Bay, *Burchell 4295 in Herb. Kew!* Port Alfred, *Burchell 3832* and *4064 in Herb. Kew!* Hillary, near Sandflats, Alexandria Division, *Burtt-Davy 1422 in Herb. Bolus!* Albany, *Burchell 3520 in Herb. Kew!* Kentani, *Pegler 743 in Herb. Bolus!* Kei Mouth, *Flanagan 172 in Nat. Herb. Pretoria!*

Central Region: Mount Boschberg, *MacOwan in Herb. Albany Mus.!*

Var. laxa Loesen.

Coast Region: Windvogelberg, *Sim 2013 in Herb. Maritzburg. Univ. Coll. 1723!* Port Alfred, *Salisbury 353 in Herb. Albany Mus.!* Kentani, *Pegler 743 in Herb. Musei Austro. Afric. 3801!* and *9535!*

Kalahari Region: Ivy Range, Transvaal. *Thorncroft 503 in Natal Govt. Herb.!*

11. C. latifolia, Ecklon and Zeyher, Plant Austr. Afric. 990, 129.

Sond. in Harv. and Sond. Fl. Cap. i. *466; Pegler in Ann. Bolus Herb.* ii, *13* (*name only*). *Celastrus heterophyllus, E. Mey. in Drège Zwei. Pfl. Docum. 52, ex Sond. in Harv. and Sond. Fl. Cap.* i, *467.*

A large climbing shrub, with greyish-brown terete branches. *Twigs* angular. *Leaves* opposite, coriaceous, sub-sessile or petiole very short, 0·5 mm. long; lamina 2·5–7 cm. long, 1·3–4·5 cm wide, broadly ovate or sub-rotund, obtuse, emarginate, sub-cordate or cordate at the base, somewhat glaucous with distinct veins and a serrate or spinuloso-serrate revolute or slightly undulate margin. *Inflorescence* a few-flowered cyme. *Peduncle* about 1·5 cm. long, very seldom less than 1 cm. long. *Flowers* 5-parted. *Sepals* 1 mm. long, sub-orbicular, with laciniated margins. *Petals* 2·5 mm. long, oblong, with uneven margins. *Filaments* 0·5 mm. long. *Disc* narrow, cupular. *Ovary* 2-chambered, with 2 ovules in each chamber, not immersed in the disc; style 0·25 mm. long; stigmas 2, linear. *Fruit* a drupe the size of a pea. The serrations in this species are further apart than in *C. tetagona*, and the margin is not so pronouncedly spinuloso-serrate or undulate.

Coast Rerion: Hermanus, *Marloth in Herb. Marloth 2789!* Kaaiman's River, George, *Truter* (*Nat. Bot. Gardens 560, 16*) *in Herb. Bolus!* Knysna, *Pappe in Herb. Musei Austro. Afric.!* Plettenberg Bay, *Ecklon and Zeyher 990 in Herb. Kew!* and *in Herb. Bolus!* and *in Herb. Musei Austro. Afric.!* Groot River, Zitzikamma, *Fourcade 665 in Herb. Fourcade!* Ratel's Bosch, Zitizkamma, *Fourcade 326 in Herb. Fourcade!* Groot River Mouth, Rob. Hoek, Humansdorp, *Fourcade 1956 in Herb. Fourcade!* Kabeljauw's River, Humansdorp Div., *Bolus 3049 and 7323 in Herb. Bolus!* Slang River, Humansdorp, *Fourcade 1814 in Herb. Fourcade!* Uitenhage, *Drège in Herb. Kew!* scrub on sand hill, Port Alfred, *Galpin 355 in Herb. Galpin! Paterson 495 in Herb. Albany Mus.!* Sandy slopes, Kowie, *Tyson in Herb. Bolus!* Kowie West, Bathurst Div., *Tyson in Herb. Bolus 13285!* Grahamstown, *MacOwan 242 in Gill Coll. Herb.!* East London, *Wood 3131! 3142! 3367 in Herb. Galpin!* Sea coast, East London, *Galpin 1836 in Herb. Galpin!* East London, *Sim 1973 in Herb. Bolus!* Kentani, *Pegler 1351 in Nat. Herb. Pretoria!* and *in Herb. Bolus!*

Central Rerion: Aliwal North, *Drège in Herb. Kew!*

Eastern Region: Mt. Edgecombe, Inanda, *Natal, Wood 1101* and *in Col. Herb. 5740!* and in *Herb. Kew!* Alexandra Dist., Natal, *Rudatis 1146 in Herb. Kew!*

12. C. capensis, Linn. Mant. 220 (1771)

Thunb. Prodr. 52 1794; Fl. Cap. ed. Schult. 269 (*1823*), *Sond. in Harv. and Sond. Fl. Cap.* i, *466, partly; Pegler in Ann. Bolus Herb.* ii, *13* (*name only*); *Enonymus Colpoon Linn Mant. Nov.* (*1771*) *Cassine Colpoon Thunb. C. Capensis* var. *Colpoon DC. Prodr. 12* (*1825*); *Sond. in Harv. and Sond. Fl. Cap.* i, *466; Burm. Rar. Afr. Pl. t. 85, 86.*

A glabrous erect shrub, with terete greyish-brown branches. *Twigs* angular, purplish-brown. *Leaves* opposite, coriaceous; petiole 2–3 mm. long; lamina 2–3·2 cm. long, 1·4–3·4 cm. wide, more or less orbicular, very obtuse, emarginate, very rounded at the base, somewhat glaucous, with the sub-recurved margin entire towards the base and bluntly

serrated upwards, and with prominent reticulate venation on the under side of the leaf. *Inflorescence* a many-flowered rather lax cyme. *Peduncle* 0·5–1 cm. long. *Pedicels* 2–3 mm. long. *Flowers* 4-parted. *Sepals* 1 mm. long, deltoid, with brown-edged laciniated margins. *Petals* 2·5 mm. long, broadly oblong, or oblong with uneven margins. *Filaments* 1·5 mm. long. *Disc* fleshy, flat, and deeply 4-lobed, with the filaments situated in the sinuses. *Ovary* 2-chambered, with 2 ovules in each chamber; style very short; stigma obsoletely 2-lobed. *Fruit* a drupe about 0·5 cm. long.

Coast Region: Saldanha Bay, *Ecklon and Zeyher 985 in Herb. Musei. Austro. Afric.!* Brackfontein and Olifantsrivier (Clanwilliam) *Ecklon and Zeyher 987 in Herb. Musei. Austro Afric!* (partly). Camp's Bay, *Alexander Prior in Herb. Kew!* Ealges Nest, Constantia Nek, *Wolley-Dod 2618* in *Herb. Kew!* Table Mountain, *Mund in Herb. Kew! Pappe in Herb. Kew! Drège in Herb. Kew!* Ravines above Groot Schuur, Table Mountain, *Smuts!* Muizenberg, *Zeyher 2202 in Herb. Musei. Austro Afric.!* near Simonstown, *Piesse in Herb. Kew! Alexander Prior in Herb. Kew! Wolley-Dod 1018 in Herb. Kew! and in Herb. Bolus! Kirk in Herb. Kew!* Gordon's Bay, *Bolus in Col. Herb. 255! in Herb. Bolus 9817!* Rhenoster Kop, Bredasdorp Div., *Schlechter 10574 in Herb. Kew!* and in *Nat. Herb. Pretoria!*

13. C. Kraussiana, Bernhardi in Flora 1844, 305.

C. Capensis, Sond. in Harv. and Sond. Fl. Cap, i, *466* (*as to syn*).

An erect glabrous shrub or small tree, with terete greyish-brown branches. *Twigs* terete or sub-angular. *Leaves* opposite, coriaceous; petiole 3–5 mm. long; lamina 2·5–5 cm. long, 1–4 cm. wide, obovate, obtuse, emarginate, cuneate at the base, paler on the under surface, with well-marked reticulate venation and slightly revolute coarsely serrated margins. *Inflorescence* a lax many-flowered cyme, branching dichotomously. *Peduncle* reaching a length of 1 cm., in many cases extremely short (in the latter case the secondary branches of the inflorescence may reach a length of 2 cm., with the succeeding branches proportionally long, thus giving the cyme a very lax appearance). *Pedicel* 1–5 mm. long. *Flowers* 4–5-parted. *Sepals* up to 1 mm. long, sub-orbicular, with a deeply laciniated margin. *Petals* up to 3·5 mm. long, oblong, spreading, with a slightly uneven margin. *Filaments* 1·5 mm. long. *Disc* fleshy, very deeply 4- or 5-lobed, with the filaments situated in the sinuses. *Ovary* not immersed in the disc, 2–3-chambered, with 2 ovules in each chamber; styles 0·5 mm. long; stigmas 2 or 3, linear. *Fruit* an ellipsoid drupe, slightly over 0·5 cm. long.

Coast Region: Hout Bay, near Capetown, *King in Herb. Forest Dept. 2381!* Tokai *King in Herb. Forest Dept. 3357!* Eagle's Nest, Constantia, *Wolley-Dod 2618 in Herb. Bolus!* Devil's Mountain and Cataract, *Pappe in Herb. Musei Austro. Afric.!* and in *Nat. Herb. Pretoria!* Table Mountain, *Sim 2328* and *in Herb. Maritzburg. Univ. Coll. 1719!* Table Mountain, *Pappe in Herb. Musei Austro. Afric.!* Table Mountain, above Kirstenbosch, *Pappe in Herb. Musei Austro Afric.!* Kirstenbosch, near Capetown, *Bolus in Herb. Bolus!* Paradise Estate, Claremont, *Pillans 3704 in Nat. Herb. Pretoria!* Fish Hoek, Cape Peninsula, *Marloth in Herb. Marloth 4422!* Duyvenhoekrivier, Swellendam, *Ecklon and Zeyher 986 in Nat. Herb. Pretoria!* Woodville, George, *Sims in Herb. Forest Dept. 3349!* "Brenton," Knysna, *in Herb. Forest Dept. 2753!* Gouna River, Knysna, *Keet in Herb. Forest Dept. 2753!* Harkeville Forest, *Knysna Keet in Herb. Forest Dept. 2758!* Gouna Plateau, Knysna, *Keet in Herb. Forest Dept. 3076!* and *575 in Herb. Albany Museum!* Gouna Forest, Knysna, *Fourcade 1909 in Herb. Fourcade!* Houteni River, Knysna, *Keet in Herb. Forest Dept. 2466!* Groot River, Zitzikamma, *Fourcade 650 in Herb. Fourcade!* Sand-dunes, Slang River, Humansdorp, *Fourcade 2180 in Herb. Fourcade!* Krakakamma, *Pappe in Herb. Musei Austro. Afric.! Burchell in Herb. Kew! Zeyher 2204 in Herb. Musei Austro. Afric.!* Forests Addo and Krakakamma, Uitenhage, *Ecklon and Zeyher 548 in Herb. Musei Austro. Afric.!* and in *Herb. Albany Museum! and in Herb. Kew!* Galgebosch, Uitenhage, *Drège in Herb. Musei Austro. Afric.!* Uitenhage, *Cooper 1510 in Nat. Herb. Pretoria! and in Herb. Kew! Cooper 1577 in Herb. Kew! Ecklon and Zeyher 986 in Herb. Kew!* and in *Herb. Bolus!* and in *Nat. Herb. Pretoria! Krauss 1792 in Herb.*

Kew! Humewood, *Paterson 2295 in Herb. Albany Museum!* Baaken's River Valley, near Port Elizabeth, *Bolus in Herb. Bolus 2224!* Port Elizabeth, *West in Herb. Bolus!* Bethelsdorp, near Port Elizabeth *Patterson 3356 in Herb. Bolus!* Algoa Bay, *Alexander Prior in Herb. Kew!* Howisonspoort, *Glass 3411 in Herb. Musei Austro. Afric.!* Grahamstown, *MacOwan 238* and *in Natal Govt. Herb. 80!* and *286 in Herb. Kew! Daly and Cherry in Herb. Albany Museum 958! Schlechter 2674 in Herb. Kew! and in Herb. Bolus! and in Herb. Albany Museum! Burchell 3568 in Herb. Kew! Atherston 105 in Herb. Kew!* Philippstown and Katrivier, *Ecklon and Zeyher 988 in Herb. Musei Austro. Afric.!* Katrivier Mountains, *Pappe in Herb. Musei Austro. Afric.!* and in *Herb. Albany Museum!* Rocky Kopjes, Fort Grey, East London, *Galpin 7818 in Herb. Galpin!* Woods near Komgha, *Flanagan 890 in Nat. Herb. Pretoria!* and in *Herb. Musei Austro. Afric.! 783 in Nat. Herb. Pretoria!* and *in Herb. Musei Austro. Afric.!* and *in Herb. Albany Museum!* Fort Cunynghame, *Sim 1923 in Herb. Albany Museum! Galpin 2467 in Herb. Galpin!* and in *Herb. Albany Museum!* Mount Coke, Katrivier, *Sim 1521 in Herb. Bolus!* Near Golara Mouth, Kentani, *Pegler 1441 in Herb. Bolus!*

Eastern Region: Pondoland, *Sim 2508 in Herb. Bolus!* Noodsberg, Natal, *Wood 934 in Herb. Kew!* and in *Herb. Bolus!* and in *Natal Gov. Herb.!* Indeni, Zululand, *Davies 3415! Wood No. 7892 in Herb. Bolus!*

14. C. croceum, Kuntze, Rev. Gen. Plant. i, 114.

Elaeodendron croceum, DC. Prod. 2, 11; Pappe. Sylv. Cap. 10; Sond. in Harv. and Sond. Fl. Cap. i, *468; Ilex crocea, Thunb. Fl. Cap. 159; Crocoxylon excelsum, Ecklon and Zeyher, Enum. Plant. Austr. Afric. 983; Rhamnus capensis Spreng; Cassine parvifolia, E. Mey and Drège 6740; Elaeodendron verrucocum, Kunth. Linn 19, 393; C. Zeyher, Turcz. Bull. Mosc. (1858) 2, 452.*

A tree, 20–40 feet high, with a diameter 2–4 feet breast high. *Branches* terete, verrucose, grey; twigs terete or sub-angular, verrucose. *Leaves* mostly opposite, coriaceous; petiole 3–6 mm. long; lamina 1·5–5 cm. long, 1–3 cm. wide, obovate or elliptic, obtuse or retuse, sometimes sub-acute, rounded or cuneate at the base, glabrous, with distinct reticulate venation, shewing especially on the under surface of the leaf, and with a serrate-crenate margin. *Inflorescence* a few-flowered cyme. *Peduncle* 0·5–1·2 cm. long. *Flowers* 4-parted. *Sepals* 1 mm. long, sub-orbicular, with entire margins. *Petals* 4 mm. long, broadly ovate, with entire margins. *Filaments* 1·5 mm. long. *Disc* fleshy and thick, with a crenate margin. *Ovary* immersed in the disc, 4-chambered, with 2 ovules in each chamber; style very short; stigma truncate. *Fruit* a globose drupe, reaching a length of more than 0·5 cm.

Coast Region: Uitenhage, *Ecklon and Zeyher in Herb. Musei. Austro Afric.! Drège in Herb. Kew!* Krakakamma and Olifantshoek (Uitenhage), *Ecklon and Zeyher 983 in Herb. Kew!* and in *Herb. Musei Austro. Afric!* and in *Herb. Albany Mus.!* Addo *Drège in Herb. Kew!* Kingwilliamstown, *Sim 1960 in Herb. Bolus!* and in *Herb. Galpin!* Queen's Park, East London, *Paetzold in Herb. Galpin 8221!* Kartivier and Kaffraria, *Ecklon and Zeyher 983 in Herb. Musei Austro. Afric.!* and *in Herb. Kew!* and *in Herb. Albany Mus.!* Fort Cunynghame, *Sim in Herb. Maritzburg Univ. Coll. 1729! 1730! Sim 2120 in Herb Bolus!* Between Kagaberg and Moncazana, *MacOwen 1685 in Herb. Musei Austro. Afric.!*

15. C. papillosa, Kuntze Rev. Gen. Plant i, 114.

Bull. Herb. Bois. 4, 432; Pegler in Ann. Bolus Herb. ii, *13. Elaeodendron papillosum, Hochst. in Krauss. Beytr. 42; E. capense, Ecklon and Zeyher Enum. Plant. Austr. Afric. 797. 127; Hook. Bot. Mag. t. 3835; Sond. in Harv. and Sond. Fl. Cap.* i, *468: Ilex crocea, Drège ex Presl. Bot. Bemerk 37; Cassine crocea, Presl Bot. Bemerk 36; Cassine lacinulata, Loes. in Bull. Herb. Boiss.* 1, *432.*

A large glabrous shrub. *Branches* terete, greyish, verrucose; twigs purplish-brown, sub-angular. *Leaves* opposite, or sub-opposite, stiffly coriaceous; petiole 0·5–1 cm. long; lamina 3–9 cm., 1–4·5 cm. wide, elliptic or ovate, acute, acutely cuneate at the base, glabrous, with distinct venation on the under surface and distinct spinuloso-serrations on the revolute margin. *Inflorescence* a few-flowered cyme. *Peduncle* usually 0·5 cm. long or less. *Flowers* pedicellate, 4-parted. *Sepals* 1·5 cm. long, ovate-oblong, with entire sometimes slightly laciniated involute margins. *Petals* 2 mm. long, oblong, with irregular undulate margins. *Filaments* 0·75 mm. long. *Disc* fleshy, flat, quadrangular, with a filament situated at each point. *Ovary* 2-chambered, with 2 ovules in each chamber; style 0·5 mm. long; stigma entire. *Fruit* an ovate drupe, 1·5–2·8 cm. long.

Coast Region: Orange Kloof, Table Mountain, *Marloth 3426 in Herb. Bolus!* Seven Weeks Poort, Zwartbergen, *Marloth in Herb. Marloth 8448!* George, *Burchell 5715 in Herb. Kew!* and in *Gill. Coll. Herb!* Zitzikamma, George, *found in Herb. Musei Austro. Afric.!* Ratels Bosch, Zitzikamma, *Fourcade 382 in Herb. Fourcade* and *in Herb. Bolus!* and in *Herb. Albany Museum!* Forests near seashore, Ratal's Bosch, Zitzikamma, *Fourcade 569 in Herb. Bolus!* and *in Herb. Fourcade!* Blauwkrantz Zitzikamma, *Glapin 3885 in Herb. Galpin!* and in *Herb. Albany Mus.!* Zitzikamma and Krakakamma (George and Uitenhage), *Ecklon and Zeyher 979 in Herb. Musei Austro. Afric.!* Knysna Commonage, *Keet Herb. Forest Dept. No. 2378 in Herb. Bolus! and in Herb. Forest. Dept. 2378!* Deepwells Forest, Knysna, *Keet in Herb. Forest Dept. 3814!* Gouna Wit-Plek Forest, *Keet in Herb. Forest Dept. 3940!* Sour Flats Forest, Knysna, *Fourcade 1913 in Herb. Fourcade!* Balmoral, Knysna, *Duthie 605 in Herb. Bolus!* Storms River Mouth, Humansdorp, *Keet 552 in Herb. Albany Museum!* and *in Herb. Forest Dept. 3068! Keet 544 in Herb. Albany Museum!* and *in Herb. Forest Dept. 3065! Keet 551* and *in Herb. Forest Dept. 3067!* Uitenhage, *Alexander Prior in Herb. Kew!* Van Stadenberg, *Zeyher 2191 in Herb. Musei Austro. Afric.!* Mountains near Grahamstown, *MacOwan and Bolus 713 in Herb. Bolus!* and in *Herb. Kew!* and in *Herb. Musei Austro. Afric.!* East London Park, *Robertson in Herb. Forest Dept. 2435!* East London, *Sim 2117 in Herb. Albany Museum! Sim 2573 in Natal Govt. Herb.! Paetzold in Herb. Galpin 8222! Sim in Herb. Maritzburg Univ. Coll. 1715!* Pirie, near Kingwilliamstown, *Sim 2154 in Herb. Bolus!* and *in Herb. Galpin!* Kentani, *Pegler 756 in Herb. Bolus!* and in *Herb. Musei Austro. Afric. 12122!* and in *Herb. Kew!* and in *Herb. Albany Museum!* Woodville, Transkei, *Sim in Herb. Forest Dept. 3332!* Kaffraria, *Sim 1335 in Herb. Bolus!* Kei Mouth, *Flanagan 862 in Nat. Herb. Pretoria!* and in *Herb. Musei Austro. Afric.!* and in *Herb. Albany Museum!* Port St. Johns, *Doran in Herb. Forest Dept. 2115!* Cape Colony, *Legat in Herb. Forest No. 812* and *in Herb. Bolus!*

Eastern Region: Indeni Forest, *Davis 140! 148! Wood 10169* and *in Natal Govt. Herb. 10793! 10794!* Port Natal, *Krauss 270 in Herb. Kew!* Bluff, Durban, *Wood 11987 in Govt. Herb. Natal!* Inswatzi, Natal, *Wylie in Wood 10079 in Nat. Herb. Pretoria!* and in *Natal Govt. Herb. 10897!* Inanda, Natal, *Wood 937 in Herb. Kew!* Natal and Zululand, *Gerrard 1859 in Herb. Kew!* In bush near Durban, *Wood 549 in Herb. Bolus!*

No Locality: *Burchell 6050 in Herb. Kew! MacOwan 2748 in Herb. Kew! Mund in Herb. Kew!*

Extracts: *Pappe in Herb. Musei. Austro Afric.!*

16. C. laurifolium, Davison comb. nov.

Elaedendron laurifolium, Harv. in Thes. Cap. ii, *54, Pl. 185.*

A shrub or small tree, glabrous in all parts. *Branches* terete, with a smooth purplish-brown bark; twigs terete or sub-angular, greyish-brown. *Leaves* opposite, coriaceous; petiole 0·5–1 cm. long; lamina 6–11 cm. long, 2–6 cm. wide, broadly oblong or elliptic, obtuse, shallowly emarginate, obtusely cuneate at the base, paler on the under surface, with an entire or remotely and minutely denticulate margin and distinct reticulate venation. *Inflorescence* a few-flowered cyme. *Peduncel* 4–8 mm. long. *Flowers* sub-sessile, 5-parted.

Sepals 1·5 mm. long, linear, with slightly uneven margins. *Filaments* 2 mm. long. *Disc* small, narrow, cupular. *Ovary* 2-chambered, with 2 ovules in each chamber; style 0·5 mm. long; stigma capitate. *Fruit* not seen.

Eastern Rerion: Port Natal, *Gueinzuis 5 in Herb. Kew!* Inanda, Natal, *Wood 1585 in Herb. Kew!* and in *Herb. Bolus!* Natal and Zululand, *Gerrard 1592 in Herb. Kew!* Zululand, *Wylie in Wood No. 8591 in Herb. Musei Austro. Afric.!* and in *Herb. Bolus! Wylie in Natal Govt. Herb. 9140!*

4. PUTTERLICKIA, Endl.

Glabrous shrubs with strong spines which are either naked or bear small tufts of leaves or undeveloped buds. *Branches* terete, greyish-brown, smooth, or verrucose. *Twigs* angular. *Leaves* alternate or tufted, coriaceous, petiolate, obovate with an entire or spinuloso-serrate margin. *Inflorescence* a lax or several-flowered cyme. *Pedicles* articulated or not articulated. *Flowers* 5-parted. *Sepals* unequal, with laciniated margins; the two outer smaller than the three inner ones. *Disc* saucer-like, either with a crenate margin and not enveloping the ovary, or fleshy and enveloping three-quarters of the ovary. *Ovary* 3-chambered with 6 ovules in each chamber; style terminal. *Fruit* a trigonous capsule, 2–2·5 cm. long; valves ligneous. *Seeds* endospermous and partly covered by an aril.

Sim, in "Forests and Forest Flora of Cape Colony," page 88, states that these shrubs are of no economic importance.

Branches smooth; pedicels 0·7–1 cm. long, articulated ..... 1. *pyracantha.*
Branches warted; pedicels about 0·2–0·3 mm. (rarely 5 mm.) long, not articulated ..... 2. *verrucosa.*

1. P. pyracantha, Endl. in Endl. Gen. 1086 (1840).

Syzsz. En. Polypet. Rehmann (1888) ii, *34; Sim Forests and For. Fl. Cap. Col. 188 (1907). Pl. 19. Celastrus pyracantdus, L. Sond. in Harv. and Sond. Fl. Cap.* i, *453; Thunb. Fl. Cap. 220; DC. Prod. 2,8; Bot. Mag. t. 1167; Ecklon and Zeyher Enum. Pl. Afric. Austr. No. 935! Celastrus integer, Thunb. Fl. Cap.; Celastrus obtusus, Thunb. Fl. Cap. 217. Celastrus campestris, Ecklon and Zeyher Enum. Pl. Afric. Austr.No. 937; Catha campestris, Presl Bot. Bem. 34.*

A straggling shrub two or more feet high, armed with strong spines. *Spines* usually 3–5 cm. long, either naked or bearing small tufts of leaves or undeveloped buds. *Branches* terete, greyish-brown, not warted. *Twigs* angular. *Leaves* tufted, coriaceous; petiole 1–4 mm. long; lamina 1·3–7 cm. long, usually about 3·5 cm. long, 0·8–3·5 cm. wide usually 1·5 cm. wide, obovate, obtuse, emarginate, cuneate at the base, glabrous and glossy, with the margin revolute and usually entire; the venation more marked on the under surface, reticulate. *Inflorescence* a loose-flowered cyme. *Peduncle* 1–2·5 cm. long. *Pedicels* 0·7–1 cm. long. articulated. *Flowers* 5-parted. *Sepals* unequal, with laciniated margins; 2 exterior ones 1·5 mm. long; 3 interior ones 2·5 cm, long. *Petals* 4 mm. long, oblong, with slightly ciliated revolute margins. *Filaments* 3 mm. long. *Disc* thick, fleshy, enveloping three-quarters of the ovary, obsoletely crenate, furrowed, with the filaments situated in the shallow sinuses. *Ovary* 3-chambered, each chamber 6-ovuled; style 1 mm. long; stigma slightly 3-lobed. *Fruit* a red woody capsule 2 cm. long. *Seeds* partly covered by an aril.

Coast Region: Saldanha Bay, *Grey in Herb. Kew!* Hottentots Holland Mts., near Gordon's Bay, *Bolus 9289 in Nat. Herb. Pretoria!* and in *Herb. Bolus!* and in *Herb. Kew!* Gordon's Bay, *Bolus in Herb. Bolus!* Zeekoe Vlei, *Bodkin in Herb. Wolley-Dod No. 868 in Herb. Kew!* and in *Herb. Bolus!* Camps Bay, *MacOwan 1822 in Herb. Musei Austro Afric!* and in *Herb. Kew! Burchell 301 in Herb. Kew!* Table Mountain, facing Camps Bay, *Schonnberg Herb. Galpin No. 4859 in Nat. Herb. Pretoria!* Table Mountain, *Burchell 242 in Herb. Kew!* Rosebank, near Capetown, *Bolus in Herb. Bolus 3820!* Riet Valley

Plate XVII.

Putterlickia pyracantha, Endl.

(Flowers from a specimen collected by H. G. Flanagan ; fruit from MacOwan, No. 1822.)

and Duiker Valley, *Ecklon and Zeyher 935 in Herb. Musei Austro. Afric.!* Buffelskraal, Riversdale Div., *Muir in Herb. Bolus 1590!* Near Mossel Bay, *Drège "a" in Herb. Kew!* and in *Herb. Musei Austro. Afric.!* Groot River, Zitzikamma, *Fourcade 1088 in Herb. Fourcade!* Seashore, Ratel's Bosch, Zitzikamma, *Fourcade 570 in Herb. Fourcade!* Gamtoos River, Humansdorp, *Fourcade 2267 in Herb. Fourcade!* Humansdorp, *Rogers 3084 in Herb. Bolus!* Grasrug, Uitenhage, *Baur 1009 in Herb. Kew!* Redhouse, Uitenhage Div., *Paterson in Herb. Bolus 537!* Zwartkops River and Krakamma, Uitenhage, *Pappe in Herb. Musei Austr. Afric.!* Near Port Alfred, Bathurst Div., *Burchell 4085 in Herb. Kew!* Barker's Valley, near Port Elizabeth, *Kensit in Herb. Bolus!* 35 miles south of Graaff-Reinet on Port Elizabeth road, *Bolus 1144 in Herb. Bolus 1662!* Grahamstown, *Galpin 57 in Nat. Herb. Pretoria!* Beaufort Dist., *Cooper 534 in Herb. Kew!* and in *Herb. Bolus!* near Kei Bridge, Butterworth Dist., *Pegler 769 in Herb. Bolus!* Prospect Farm, Komgha Dist., *Flanagan 136 in Herb. Musei Austro. Afric.!*

Central Region: Zuurberg, Somerset Div., *Drège "b"* in *Herb. Kew!* Fish River, *Burchell in Herb. Kew!*

Kalahari Region: Springfield, Griqualand West, *Wilman in Herb. Bolus 1315!*

Without Locality: *Zeyher 2176 in Herb. Kew! Prior in Herb. Kew! Burchell 8392 in Herb. Kew!*

The coppice shoots have larger alternate membranous leaves with a spinuloso-serrate margin, and are very different from the older plants, where the leaves are smaller, coriaceous, tufted, and with an entire margin.

2. P. verrucosa, Szysz. En. Polypet, Rehmann. ii, *34* (1888)

Sim Forests and For. Fl. Cape Col. 189 (1907); Pegler in Ann. Bolus Herb. ii, *13* (*name only*). *Celastrus verrucosus, E. Meyer in Drege Zwei. Pfl. Docum.* (*Pl. XIII, Fig. I*).

A spiny shrub with terete verrucose branches and angular twigs. *Spines* strong measuring up to 5 cm. long. *Leaves* tufted, coriaceous; petiole 1–2 mm. long; lamina 2–4 cm. long, 1–2 cm. wide, obovate, obtuse, emarginate, cuneate at the base, glabrous, with an entire or serrate revolute margin, and the venation more marked on the under than on the upper surface. *Inflorescence* a few-flowered cyme. *Peduncle* 1·5–2 cm. long (rarely 5 mm.), not articulated. *Pedicels* 0·2–0·3 cm. long. *Flowers* 5-parted. *Sepals* equal, 2 mm. long, sub-orbicular, with a laciniated margin. *Petals* 2·5 mm. long, oblong or obovate, with a ciliated margin. *Filaments* 2 mm. long; anthers small. *Disc* saucer-like, with a slightly crenate margin. *Ovary* 3-chambered, with 6 ovules in each chamber; style 0·5 mm. long; stigma 3-lobed. *Fruit* a brownish-red woody capsule, measuring up to 2·5 cm. long; seeds partly covered by an aril.

Coast Region: Kingwilliamstown, *Sim 1967* and *in Herb. Maritzburg Univ. Coll. 1665! 1697! 1698!* and in *Herb. Bolus!* Fort Cunynghame, *Sim 1001* and *in Herb. Maritzburg Univ. Coll. 1699!* and in *Herb. Bolus!* Woods near Komgha, *Flanagan 606 in Nat. Herb. Pretoria!* and in *Herb. Musei Austro. Afric.!* Kentani, *Pegler 602 in Herb. Kew! and in Herb. Bolus!*

Eastern Region: Port Natal, *Peddie in Herb. Kew!* Natal, *Wood 134 in Herb. Bolus! Saunders in Herb. Bolus!* Attercliffe, *Sanderson 349 in Herb. Kew!* Inanda, *Wood 615 in Herb. Kew! and in Herb. Musei Austro Afric. Wood 1135 in Herb. Kew!* Groenberg, *Wood 587 in Herb. Kew.* Durban, *Wilms 1913 in Herb. Kew.* Dumisa, *Rudatis 1167 in Herb Kew!*

5. LAURIDIA, E. and Z.

Glabrous unarmed shrubs. *Leaves* opposite, petiolate, coriaceous. *Inflorescence* racemose. *Flowers* 4-parted. *Sepals* equal. *Disc* obscurely lobed at the margin. *Ovary* half immersed in the disc, 2-chambered, with two erect ovules in each chamber *Fruit* a drupe. *Seeds* endospermous.

This is a monotypic genus, the plant from Damaraland collected by Marloth (No. 1196) and named *Lauridia multiflora* by Engler is *Salvadora persica*, Garcin ex L.

Lauridia has been kept as a separate genus by Bentham and Hooker (*Genera Plantarum*) and by Sonder in the Flora Capensis. In the Index Kewensis, however, this genus is sunk under *Elaeodendron*, Jacq. I have followed Bentham and Hooker and Sonder in keeping this as a separate genus on account of the racemose inflorescence, which is unique in the family *Celastraceae*.

1. L. reticulata, Ecklon and Zeyher in Enum Plant Austr Afric 968 (*Pl.XIV, Fig. 2*).

Sond in Harv.and Sond. Fl. Cap. i, *469. Lauridia rupicola, Ecklon and Zeyher l.c., 969.*

A glabrous unarmed shrub 8–10 feet high. *Branches* terete, grey. *Twigs* angular, grey. *Leaves* opposite, coriaceous; petiole 2·5-3 mm. long; lamina 2·5–3·75 cm. long, 0·8-1·75 cm. wide, ovate or oval, acute or obtuse, sometimes slightly emarginate, rounded or slightly narrowed at the base, smooth and veinless above, with distinct veins and raised midrib beneath, with an entire or sparingly toothed and slightly revolute margin. *Inflorescence* a short panicle about 1 cm. long, with sub-sessile flowers. *Axis* angular. *Bracts* 3, persistent, with a laciniated margin; outer 1·5 mm. long; 2 inner 1 mm. long. *Flowers* 4-parted. *Sepals* equal, 1 mm. long, sub-orbicular, fleshy, with very slightly laciniated margins. *Petals* 1·5 mm. long, ovate. *Disc* fleshy, slightly 4-lobed. *Ovary* half immersed in the fleshy disc, 2-chambered, with 2 erect ovules in each chamber; style very short; stigmas 2, bifid. *Fruit* not seen, but Sonder says: "Drupe, of which few have been examined, as large as a small pea, roundish and reddish.',

Coast Region: Winterhoek, near Uitenhage, *Ecklon and Zeyher 96 in Herb. Musei Austro. Afric.!* and in *Herb. Bolus!* Zoutpanshoogde at Zwartkop rivier, Uitenhage, and Bothasberg between Grahamstown and Vishrivier, *Ecklon anh Zeyher 968 in Herb. Musei Austro. Afric.!* Grahamstown, *Sim 87* and *in Herb. Maritzburg Univ. Coll. 173 !*

6. CATHA, Forsk.

Glabrous unarmed shrubs with terete branches and compressed glaucous twigs. *Leaves* opposite, petiolate, lanceolate, coriaceous, and repand-serrate. *Inflorescence* a short dense many-flowered cyme. *Flowers* 5-parted. *Sepals* equal, deeply laciniated. *Petals* oblong. *Disc* saucer-like, with a crenate margin. *Ovary* situated in the centre of the concave disc but not enveloped by it, 3-chambered, each chamber containing 2 erect ovules: style terminal; stigma sub-sessile, 3-lobed. *Fruit* an oblong 3-celled capsule.

Sonder in "Harvey and Sonder Flora Capensis," i, 463, gives the following information of this plant under the name *Methyscophyllum*:—

> "This is the Bosjeman's-thee of the colonists. The leaves chewed to excess by the Bosjemen have intoxicating effects; a moderate infusion is said to be as good as tea, and also as a remedy for asthma. The properties, perhaps, are similar to those of the Paraguay tea, a shrub not distantly related to the present."

Pappe, in "Florae Cap. Med. Prod.," p. 9, states:—

> "An infusion of the leaves of this shrub is pleasant to the taste, and used in cough, asthma, and other diseases of the chest. It grows about the Zwarte Kei River, where it is a favourite beverage with the Bushmen and others, who also chew it and call it Bosjeman's-thee."

It is not very common in South Africa. It occurs along the coast from Knysna up to Natal, and also in the Kalahari region in the eastern and northern Transvaal. It occurs also in Abyssinia and is cultivated in Arabia.

1. C. edulis, Forsk. Fl. Aegypt. Arab. 63 (*1775*).

Endl. Gen. 5942; Oliv. Flor. Trop. Afric. i, *36; Methyscophyllum glaucum, Ecklon and Zeyer, Enum. 1138, 152; Sond. in Harv. and Sond. Fl. Cap.* i, *6; Hartogia Thea, E. Mey. in Drège Zwei. Pfl. Docum. 189. Trigonotheca serrata, Hochst. in Flora (1841) 662; Catha Forskalli, Rich. Flor. Abyss,* i, *134. tab. 30; Catha inermis J. F. Gmel. Syst. 411.*

Plate XIV.

1. *Pleurostylia capensis*, Oliv.
(Hutchins in Herb. Norm. Austro. Afric. 915.)

2. *Lauridia reticulata*, E. & Z.

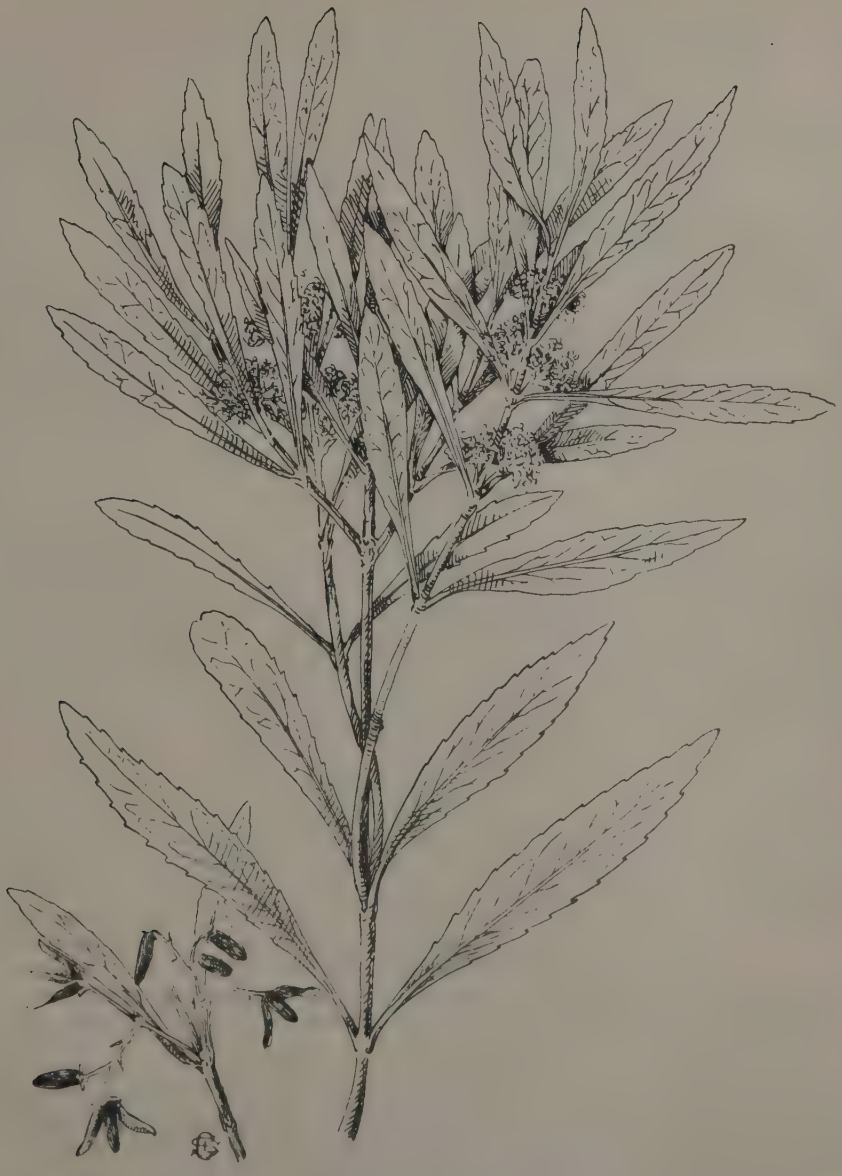

Plate XV.

Catha edulis, Forsk.
(Hutchins No. 2981.)

A resinous unarmed tree attaining a height of 20 feet. *Branches* terete, greyish. *Twigs* with a ridge across at the insertion of the opposite petioles, compressed, greyish, glaucous. *Leaves* opposite, coriaceous; petiole 5 mm. long; lamina 4·5–9 cm. long, 0·6–3 cm. wide, lanceolate, acuminate, sub-emarginate, cuneate at the base, glaucous, with the margin repand-serrate, revolute, and the veins reticulate, prominent. *Inflorescence* a dense-flowered cyme. *Peduncle* stout, 2–5 mm. long, rarely 1 cm. long. *Flowers* 5-parted. *Sepals* equal, 1 mm. long, sub-orbicular, with deeply laciniated margins. *Petals* 2–5 mm. long, oblong, with ciliated margins. *Filaments* 1·5 mm. long, slender; anthers 0·5 mm. long. *Disc* saucer-like, with a crenate margin. *Ovary* 3-chambered, each chamber 2-ovuled; stigma sub-sessile, obsoletely 3-lobed. *Fruit* oblong, 3-chambered, 6–9 mm. long, dehiscing loculicidally.

Coast Region: Knysna, *Burchell 5520 in Herb. Kew!* In cultivation at Rockwood, Queenstown, introduced from Hot Fire, White Kei, Cathcart, *Galpin 2499 in Nat. Herb. Pretoria!* and in *Herb. Maritzburg Univ. Coll. 1731!* Junction Farm, Gwatyn, Queenstown Dist., *Galpin 8084 in Nat. Herb. Pretoria!* Mt. Windvogelberg, Queenstown, *Baur 142 in Herb. Kew!* and in *Herb. Bolus!* and in *Herb. Musei Austro. Afric.!* Windvogelberg Mt. and Zwart Kei River, Cathcart Div., *Drège in Herb. Kew! Ecklon and Zeyher 1138 in Herb. Musei Austro. Afric.!* Perie Forest, *Hutchins 2981 in Herb. Musei Austro. Afric.!* Kaffraria, *Baur 1124 in Herb. Kew!* Kentani, *Pegler 2111 in Herb. Bolus!*

Central Region: Cultivated in garden at Graaff-Reinet from near Queenstown, *Bolus in Herb. Bolus 1856!*

Kalahari Region: Concession Creek, Barberton, *Thorncroft 814 in Nat. Herb. Pretoria!* Highland Creek, near Barberton, *Thorncroft 669 in Nat. Herb. Pretoria!* Mac-a-Mac Falls, Lydenburg District, *Burtt-Davy 1452 in Nat. Herb. Pretoria!* Spelonken, N. Zoutpansberg, *Bailey in Transvaal Dept. Agric. Herb. No. 3018* and *in Nat. Herb. Pretoria!* Between Tzaneen and Modingen, Zoutpansberg, *Burtt-Davy 2648 in Herb. Bolus!* Between Medingen and Dicke's, Modgadjies Mts. (High Veld), *Burtt-Davy Col. Herb. No. 2696* and *in Nat. Herb. Pretoria!* and in *Herb. Bolus!*

Eastern Region: Natal, *Gerrard 745 in Herb. Kew!* Cultivated in Botanic Gradens, Durban, *Wood, in Col. Herb. No. 3088* and *in Nat. Herb. Pretoria!*

Rhodesia: Matopos in Kloof, *Eyles 977 in Herb. Musei Austro. Afric.!* Bulawayo, *Rogers 13570 in Herb. Musei Austro. Afric.!* and in *Herb. Bolus!* Odzani River Valley, Manica Dist., Div. Umtali, *Teague 112 in Herb. Bolus!* and in *Herb. Musei Austro. Afric.!* near Chirinda Forest, Rhodesia, *Swynnerton 102 in Herb. Musei Austro. Afric.!*

Nyasaland: *Buchanan 287 in Herb. Musei Austro. Afric.*

7. PLEUROSTYLIA, Wight et Arn.

A large glabrous unarmed tree, with greyish-brown rough and fissured bark, which contains a red pigment. *Twigs* opposite, angular. *Leaves* opposite, shortly petiolate. *Inflorescense* a few-flowered cyme. *Flowers* 5-parted. *Sepals* equal. *Disc* fleshy, flat, furrowed, crenate at the margin, surrounding the base of the ovary. *Ovary* 1-chambered, with 6–8 ovules; placentation parietal; style very short; stigma peltate, slightly lateral in the young stage, distinctly lateral in mature furit. *Fruit* a dry 1-locular 1-seeded capsule, curved on one side. (As the ovary matures the style becomes distinctly lateral, and in the mature fruit the position of the style is marked by a scar half-way up one side.)

This is a monotypic genus found north of Kingwilliamstown and in the Eastern and Transkeian Conservancies, Pondoland, Natal, and Zululand. It is found in the mountain forests, but occurs more frequently as a spreading tree near the coast. The tree is reserved in all the conservancies. It is known by the common names of Bastard Safraan, Hard Pear, Umngqangqua, and Mbomvane. Fourcade states (Report, pp. 100 and 133): "Wood heavy, hard, moderately strong and elastic, close-grained and compact, with

well-defined concentric wavy bands of soft tissue ; medullary rays very fine, close ; pores small, numerous, irregularly distributed ; colour white or pale yellow, tinged with pink ; used for wagon-wood." The mature tree, however, is too scarce to be of any economic value.

1. P. capensis, Oliv. in Hook. Icones Plant. 23 (1894), t. 2297. (Pl. XIV, Fig. 1.)

Pegler in Ann. Bolus Herb. ii, *13* (*name only*) ; *Cathastrum capense, Turcz. Bull. Soc. Nat. Mosc. 31* (*1858*), i, *448* ; *Harv. in Harv. and Sond. Fl. Cap.* i. *527.*

A large unarmed tree up to 40–50 feet in height, and sometimes 2–3 feet in diameter breast high. *Branches* greyish-brown, with bark fissured. *Twigs* opposite, angular. *Leaves* opposite, coriaceous ; petiole 1–2 mm. long ; lamina 2·5–6 cm. long, 0·8–2·3 cm. wide, lanceolate or oblong-lanceolate, acuminate, obtuse, sometimes sub-emarginate, cuneate at the base, paler beneath, glabrous, with the margins entire undulate and the veins distinct. *Inflorescence* a few-flowered cyme. *Peduncle* 2–8 mm. long. *Flowers* 5-parted. *Sepals* equal, 1 mm. long, orbicular, with the margins irregularly laciniated. *Petals* 3 mm. long, oblong or sub-orbicular, ciliolate, reflexed. *Filaments* 2 mm. long, flatter and broader at the base ; anthers 0·5 mm. long. *Disc* fleshy, flat, furrowed, crenate on the margin, surrounding the base of the ovary. *Ovary* 1-chambered, 6–8-ovuled, with parietal placentation ; style very short, slightly lateral in young stage, distinctly lateral in mature fruit ; stigma peltate. *Fruit* a curved dry 1-locular 1-seeded capsule, bearing a scar half-way up the curve on one side. (This is caused by the style which becomes lateral as the ovary matures.)

Coast Region : Kologha, north of Kingwilliamstown, *Hutchins in Nat. Herb. Pretoria !* and in *Herb. Kew !* and in *Herb. Norm. Austro Afric 915 !* and in *Herb. Bolus !* Perie Forest, near Kingwilliamstown, *Tyson in Herb. Bolus 5956 !* Line Drift, Peddie, *Sim in Herb. Galpin 6283 !* in woods near Komgha, *Flanagan 623 in Nat. Herb. Pretoria !* and in *Herb. Kew !* and in *Herb. Norm. Austro Afric. !* and in *Herb. Bolus !* Kentani, *Pegler 857 in Herb. Kew !* and in *Herb. Bolus !*

Eastern Region : Amanzamnyana Forest, Umtata, *Niblock-Stuart in Herb. Forest Dept. 3098 !* and in *Nat. Herb. Pretoria !* Natal and Zululand, *Gerrard 1596 in Herb. Kew !*

8. MAUROCENIA, Lian.

An erect unarmed glabrous shrub, with grey terete branches and purplish angular twigs. *Leaves* opposite, very leathery, with entire hard-ridged revolute margins, and a prominent thick midrib on the under surface. *Inflorescence* a several-flowered cyme, with short stout peduncle and articulated pedicels. *Flowers* 5-parted. *Sepals* equal. *Disc* saucer-shaped. *Ovary* 2-chambered, with 2 pendulous ovules in each chamber. *Fruit* a somewhat fleshy drupe containing an exarillate endospermous seed.

This is a monotypic genus, occurring chiefly in the coast region from Saldanha Bay to Caledon. It was named in honour of a Venetian horticulturist, F. Mauroceni. It is commonly known as " Hottentot Cherry " on account of the succulent drupe, which is about the size of a small cherry.

1. M. frangularia, Mill. Dict. edit. 8a (1768), No. 1.

Maurocenia capensis, Sond. in Harv. and Sond. Fl. Cap. i, *465 ; Hooker Icones Plantarum, t. 552 ; Cassine Maurocencia, Linn. Spec. edit. 1a* (*1753*), *269 ; edit 2a* (*1762*) *385 ; Reich. Syst. Pl. 1* (*1779*). *736 ; Lam. Dict. 1* (*1783*), *653 ; Murr. Syst. Veget.* (*1784*), *295 ; Thunb. Prod. Cap.* (*1794*), *52 ; Gmel. Syst. Veget.* (*1796*), *497 ; Murr. Syst. Veget. edit. Pers.* (*1797*), *313 ; Willd. Spec. 1* (*1798*), *1493 ; Pers Synops 1* (*1805*), *sp. 4 ; Willd. Enum.* (*1809*), *328 ; Ait Hort. Kew Edit. 2a,* cI (*1811*), *170 ; Thunb., Fl. Cap. ed. Schultz* (*1823*), *268 ; Ecklon and Zeyher, Enum. Pl. Afric. Austr.* (*1834–1837*), *984, p. 128. Frangula sempervirens, Dill. Elth. 146, t. 121. f. 147.*

Plate XIX.

Maurocenia frangularia, Mill.
(Lion's Head ; Pappe in Herb. Kew.)

An erect glabrous unarmed shrub, 4–5 feet high. *Branches* terete, greyish. *Twigs* purplish, angular. *Leaves* opposite, extremely leathery; petiole very stout, 3 mm. long; lamina 3·5–6 cm. long, 2–4 cm. wide, sub-orbicular, ovate or obovate, obtuse, sub-emarginate, rounded at the base, with entire hard-ridged revolute margins, and with the veins, especially the midrib, raised on the under surface. *Inflorescence* a several-flowered cyme. *Peduncle* stout, 1–3 mm. long. *Flowers* 5-parted. *Pedicels* 4–7 mm. long, articulated near the base. *Sepals* equal, 1 mm. long, sub-orbicular, with deeply laciniated margins. *Petals* 2 mm. long, oblong, with slightly irregular margins. *Filaments* 1 mm. long. *Disc* fleshy, saucer-like, with a crenulate margin. *Ovary* situated in the concave disc, but not enveloped by it, 2-chambered, with 2 pendulous ovules in each chamber; stigma sub-sessile, 2-lobed. *Fruit* a somewhat fleshy drupe. *Seed* exarillate, endospermous.

Pappe, in "Silva Capensis," p. 10, says of this plant: "Shrubby, usual height of stem 3 feet, diameter 3–4 inches. Bark grey, very craggy. Wood fine, pretty hard and tough. It looks well when polished, being yellow with brownish veins. It is very fit for the manufacture of musical instruments."

Coast Region: Saldanha Bay, *Grey in Herb. Kew!* Hottentot Holland Mts., Caledon Div. *Ecklon and Zeyher in Herb. Musei Austro. Afric.!* Hout Bay, *Wolley-Dod 1045 in Herb. Kew!* Green Point and Camps Bay, *Alexander Prior in Herb. Kew!* Camps Bay, *Alexander Prior in Herb. Kew!* Kloof between Lion's Head and Table Mountain, *Burchell 255 in Herb. Kew!* Devil's and Lion's Mount, *Pappe in Herb. Kew!* and in *Nat. Herb. Pretoria!* and in *Herb. Norm. Austro Afric.!* Table Mountain, *Ecklon and Zeyher 984 in Nat. Herb. Pretoria!* Table Mountain, *Ecklon anh Zeyher in Herb. Kew!* Muizenberg, *MacOwan 580 in Herb. Kew!* and in *Nat. Herb. Pretoria!* and in *Herb. Bolus!* Fish Hoek, *Page in Herb. Bolus 16020!* Castle Rock, near Miller's Point, *Wolley-Dod 836 in Herb. Bolus!* Hottentot Holland Mts., *Pappe in Herb. Bolus!* Hills near Genadendal Caledon Dist., *Ecklon and Zeyher in Herb. Musei Austro. Afric.!*

9. HARTOGIA, Thunb.

A small unarmed shrub or tree. *Branches* and *twigs* grey. *Leaves* opposite, coriaceous, petiolate. *Inflorescence* a several-flowered, fairly lax cyme. *Flowers* 4-parted. *Sepals* equal. *Disc* fleshy, deeply 4-lobed. *Ovary* 2-chambered, with 2 ovules in each chamber. *Fruit* fleshy when young, finally dry, indehiscent. *Seed* exarillate, exendospermous. *Thunb. Diss. Nov. Gen. 5, 35, cum ic.* (*Schrebera, Thunb. Nov. Act. Ups.* i, *91, t. 5, f. 1, ex Harv. and Sond. Fl. Cap.* i, *464.*)

This is a monotypic genus found commonly in the south-western districts on the edge of forests or in small patches of bush. It is named in honour of John Hartog, an early Dutch traveller who visited South Africa.

1. H. capensis. Thunb. nov. Gen. Plant. (1781–1801) 5, 87, with plate facing p. 96. (Pl. XII, Fig. 2.)

Linn. Syst. Nat. Ed. 13 (1791), 2, 278; DC. Prod. 2, 12; Thunb. Fl. Cap. ed Schultz (1823), 142; Ecklon and Zeyher Enum. Pl. Afric. Austr. (1834–1837), 980, 127. Sond. in Harv. and Sond. Fl. Cap. i, *464. Schrebera schinoides, Thunb. nov. act. Ups.* i, *91, 5, f.* i; *Thunb. Prod. 28, Prod. t. 2. Hartogia riparis, Ecklon and Zeyher Enum. Pl. Afric. Austr. (1834–1837). 982, p. 127. Hartogia multiflora, Ecklon and Zeyher Enum. Pl. Afric. Austr. (1834–1837) 981, p. 127. Hartogia capensis, ?., E. Mey. in Drège Zwei Pfl. Docum. 87.*

A small unarmed usually much-branched tree, growing to a height of 10–20 feet, with a diameter of 1–1½ feet breast high. *Branches* terete, with a grey somewhat wrinkled bark. *Twigs* angular, greyish. *Leaves* opposite, coriaceous, extremely variable; petiole 5–7 mm. long; lamina 3·5–5·5 cm. long, 1–1·8 cm. wide, ovate-lanceolate or lanceolate obtusely acuminate, emarginate, cuneate at the base, glabrous, with coarse serrations on the upper

three-quarters of the slightly revolute margins, with the venation reticulate and with the midrib raised on the upper surface. *Inflorescence* a several-flowered fairly lax cyme. *Flowers* 4-parted. *Sepals* equal, 0·75 mm. long, triangular, with dark-brown laciniated margins. *Petals* 2·5 mm. long, oblong, with slightly laciniated margins. *Filaments* 1 mm. long. *Disc* fleshy, deeply 4-lobed ; each lobe forming a fleshy cushion between the filaments, which are situated in the sinuses. *Ovary* 4-sided and 2-chambered, with each chamber 2-ovuled ; style 0·5 mm. long ; stigmas 2, bifid. *Fruit* fleshy when young, finally dry, indehiscent. *Seed* exarillate and exendospermous.

Pappe gives it the common names " Swal-blad " and " Lepel-hout," and states in " Silva Capensis," p. 10 : " Height from 12–15 feet ; diameter from 1–1½ feet. Bark thin, greyish white, more or less wrinkled. Wood hard, fine-grained, close and tough. It is adapted for all kinds of fancy furniture, and invaluable to the cabinetmaker for veneering. Turners also and instrument-makers will find it well adapted for the manufacture of the articles of their trade. In the interior it serves for the construction of wagons and rural utensils."

Coast Region : Berg River and Saldanha Bay, *Ecklon and Zeyher 982 in Herb. Musei Austro. Afric.!* Ceres, *Bolus in Herb. Bolus!* Du Toit's Kloof, Worcester Div., *Drège a in Herb. Kew!* and in *Herb. Musei Austro. Afric.!* Du Toit's Kloof, *Drege ? in Herb. Musei Austro. Afric.!* Tulbagh and Worcester, *Ecklon and Zeyher 981 in Herb. Kew!* and in *Herb. Musei Austro. Afric.!* Paarl Mountain, *Drège ? in Herb. Kew!* Ravines, south of Kirstenbosch, Cape Peninsula, *Pillans 3796 in Nat. Herb. Pretoria!* and in *Herb. Kew!* Kirstenbosch, *Bolus in Herb. Bolus!* Lower part of Platte Klip Ravine, Table Mountain *Page in Herb. Bolus 16340!* Table Mountain *Ecklon and Zeyher 982 in Herb. Musei Austro. Afric.! Alexander Prior in Herb. Kew!* Genadendal, *Alexander Prior in Herb. Kew!* Zonder Einde, Caledon, *Zeyher 307 in Herb. Musei Austro. Afric.!* Zwartberg, Caledon, *Schlechter 9771 in Herb. Bolus!* Kleinriversberg and Twenty-four Rivers, *Zeyher 2206 and 307 in Herb. Musei Austro. Afric.!* Swellendam, *Ecklon and Zeyher 980 in Herb. Kew!* and in *Herb. Musei Austro. Afric.! Burchell 7225 in Herb. Kew! Mund in Herb. Kew!* and in *Herb. Musei Austro. Afric.! Zeyher in Herb. Musei Austro. Afric.!* Grootvardersbosch, Swellendam, *Zeyher in Herb. Musei Austro. Afric! Pearson in Herb. Bolus 15542!* Langebergen, near Swellendam, *Schlechter 2054 in Herb. Bolus!* Corenti River Farm, Riversdale Dist., *Muir 5067 in Nat. Herb. Pretoria!* above the waterfall at Garcia's Pass, Riversdale Div., *Burchell 6970 in Herb. Kew!* Lower part of the Langebergen, at Garcia's Pass, Riverdale Div., *Burchell 6931 in Herb. Kew!* Milkwood, Sheep Bos Creek, Knysna, *Keet 603 in Nat. Herb. Pretoria!* Kleinbos, Buffel's Nek, *Keet, Herb. Forest Dept. No. 2372 in Nat. Herb. Pretoria!* In forest, Ashkop, Zitzikamma, *Fourcade 155 in Herb. Bolus!* and in *Nat. Herb. Pretoria!* Grahamstown, *Schlechter 2674 in Herb. Bolus!*

THE GENUS MACOWANIA, OLIV.

By C. A. SMITH, B.Sc., Division of Botany, Pretoria.

WHILE examining a batch of *Compositae* recently, a specimen labelled *Macowania glandulosa* could not be fitted into this species nor into either of the other two known species. This led to an examination of all the species of *Macowania* and species of *Nestlera*, into which latter genus the specimen referred to was eventually placed.

Having spent some time on the genus *Macowania* and having examined all the available South African material, it appeared desirable to place these observations on record. The writer is indebted to the Curators of the Herbaria of the Transvaal Museum, Albany Museum and the South African Museum for sending him their respective material on loan.

MACOWANIA, Oliv.

Heads terminal, solitary, peduncled, sessile, or sub-sessile, heterogamous, radiate. *Involucre* hemispherical, sub-globose, or campanulate; scales pluriseriate, imbricate, unequal; the outer gradually shorter, densely covered with stalked glands without, nude within, acute or obtuse, sometimes accuminate, with the margins scarious, entire, sometimes minutely lacerated near the apices. *Receptacle* convex, nude, honeycombed. *Ray florets* uniseriate, female, fertile. *Corolla* yellow, ligulate, spreading; tube glabrous or glandular-hairy. *Ovary* terete, oblong in outline, ribbed, villous or pubescent; style deeply cleft, cylindric, glabrous; branches flat, linear, obtuse. *Disc florets* bisexual, sterile. *Corolla* yellow, tubular, 5-fid; tube cylindric for two-thirds of its length, then abruptly campanulate or (in one species) becoming wider, glabrous or glandular-hairy on the cylindric portion only; lobes sub-triangular, acute, becoming reflexed. *Anthers* slightly exerted in older florets, sagittate and tailed at the base, with an ovate or oblongo-ovate acute or sub-acute apical appendage. *Ovary* sometimes slightly curved, terete, obscurely ribbed, villous or shortly pubescent; style cylindric, bifid and minutely setulose near the apex, or distinctly two-branched and glabrous; branches linear, flat truncate, papillose. *Pappus* in both ray and disk florets of many rigid bristles, shorter than or sub-equalling the corolla tube, uniseriate, persistent or (in one species) caducous, barbellate.

Much branched glandular bushy shrubs, the branchlets arranged in leafy corymbs; leaves alternate, sessile, linear, with the mid-rib sunken above, evident beneath, and with strongly revolute margins.

KEY TO THE SPECIES.

1. Leaves spreading or reflexed; pappus bristles of disc florets *shorter* than the cylindric part of the corolla-tube; style of disc florets shortly bifid ..... 1. *M. revoluta, Oliv.*
   Leaves ascending; pappus bristles of disc florets *longer* than the cylindric part of the corolla tube; style of disc florets distinctly 2-branched ..... 2.
2. Pappus bristles *tufted* at or near the apices; achenes *villous* 2. *M. glandulosa, N.E. Br.*
   Pappus bristles *not* tufted at or near the apices; achenes *pubescent* ..... 3. *M. pulvinaris, N.E. Br.*

1. **M. revoluta,** Oliv.

Heads peduncled, 2·5 cm. in diam. (including the rays); peduncles 1–8 mm. long, glandular-hairy with stalked glands. *Involucre scales* edged with brown round the apices, woolly on the dorsal surface; outer scales 3–6 mm. long, 1–2 mm. broad, ovate, acute or obtuse, mucronate; inner 6–8·5 mm. long, 2 mm. broad, mostly elongate, ovate to oblongo-ovate, mucronate; innermost 7·5 mm.–1·5 cms. long, 1·5–3 mm. broad, linear-oblong, membranous, obtuse. *Receptacle* 3–4 mm. in diam. *Ray florets* 8–9; lamina minutely 3-toothed; tube 3–4 mm. long, terete, widening above, glandular-hairy. *Ovary* pubescent (mature achenes 17-ribbed); style 5–7 mm. long; branches 2–3 mm. long, obtuse. *Corolla* of disc florets 6 mm. long, cylindric for two-thirds of its length, then abruptly campanulate, with the cylindric part glandular-hairy, and the upper part glabrous; lobes 0·5 mm. long, with a few stalked glands at the apices. *Ovary* pubescent; style 5–6 mm. long, very shortly bifid, stigmatic part minutely setulose. *Pappus bristles* caducous, shorter than the corolla tube.

Shrub up to 1·2 metres high, with the branches densely glandular-hairy towards their apices; leaves 1–3 cm. long, divaricate or strongly reflexed, crowded, acute, with a distinct yellow to brown mucro, standing on broad bases, scabrid on the upper surface with short white stiff hairs, variously canescent below.

Distribution: Stutterheim Div., Katberg: *MacOwan* in *Nat. Herb.* 2037!; King-williamstown Div., Pirie Mtn., *Leighton* in *Herb. Norm. Austro-Afr.* 225!, and in *Nat. Herb.* 2035! 2921! 2923!, and in *Herb. MacOwan* 2013!, *Galpin 5930*!, and in *Nat. Herb.* 2036!, *Sim* 1029, *Flanagan 2144*!, and in *Natal Govt. Herb. 6827*!, and in *Nat. Herb. 2922*!; Wolf River Plateau, Keiskama Hoek, *Stayner* 28!; Victoria East Dist., Hogsback Mtns., *Rattray* 304!

2. **M. glandulosa,** N.E. Br.

Heads sessile or sub-sessile, surrounded by the upper leaves, 1·5–2 cm. in diam. (including the rays). *Involucre scales* edged with brown round apices, sometimes bluntly keeled; outer scales 3–4 mm. long, 1·5 mm. broad, oblong-elliptic, mucronate; the inner 5–8 mm. long, 1·5 mm. broad, obovate-oblong, mucronate; the innermost 1–1·2 cm. long, 1·5 mm. broad, linear, membraneous, acute. *Receptacle* 2–3 mm. in diam., honeycombed, with the margins of the cells fimbrillate. *Ray florets* 20–24; lamina oblong-elliptic, minutely trifid, sometimes bifid; tube terete, widening above, entirely glabrous. *Ovary* villous, with the bristles rigid, ascending; style 4·5 mm. long, ventricose at the base, arising from a flattened disc; branches 1 mm. long. *Corolla* of disc florets 5·5 mm. long, cylindric for two-thirds of its length, then gradually broader, entirely glabrous; lobes 0·5 mm. long, with a few stalked glands near the apices. *Ovary* densely villous; bristles rigid, ascending; style 5 mm. long, 2-branched, ventricose at the base, arising from a flattened disc; branches 1 mm. long truncate, papillose at the apex. *Pappus bristles* persistent, sub-equalling the corolla tube, tufted at or near the apices.

Young stems cobwebby, with numerous leaf-scars; leaves 1·1·8 cm. long, ascending, crowded, acute, with a short apical spine, glabrous and glandular-punctate on the upper surface, white-woolly below.

Distribution: Natal, Tabamhlope Mtn., *Evans* 412!, and in *Natal Govt. Herb.* 8811!, and in *Nat. Herb.* 2938!, *Wylie* in *Herb. Wood* 10629!, and in *Nat. Herb.* 2924!; Langalibalele's Location, *Fannin* 2013.

Note.—N. E. Brown (Kew Bull., 1901, p. 125) described the stems of *M. glandulosa* as being glandular-hairy, but I failed to note this on any of the specimens of Evans 412 (type number), so that this character must be variable.—C. A. S.

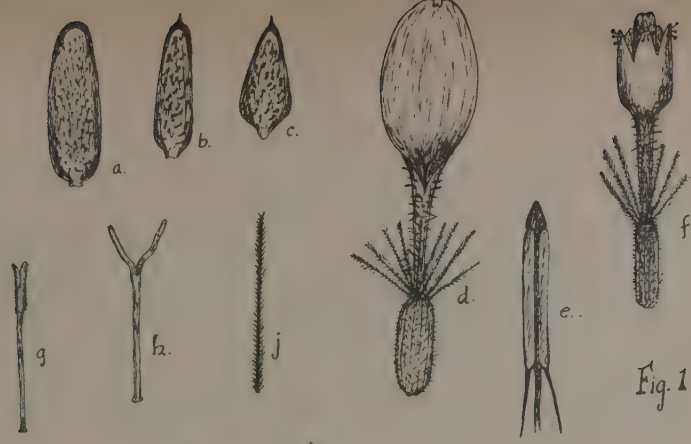

Fig. 1.

Fig. 2

Fig. 3.

EXPLANATION OF PLATE :

Fig. 1. ***Macowania reroluta***, Oliv.

a = innermost involucral scale ; *b* = inner involucral scale ; *c* = outer involucral scale ; *d* = ray floret with pappus ; *e* = anther of disc floret, showing tails ; *f* = single disc floret, showing pappus : *g* = style of disc floret : *h* = style of ray floret ; *j* = single pappus bristle, showing barbs.

Fig. 2. ***Macowania glandulosa***, N. E. Br. Letters as in Fig. 1.

Fig. 3. ***Macowania pulrinaris***, N. E. Br. Letters as in Fig. 1.

3. **M. pulvinaris,** N.E. Br.

Heads peduncled, 1–1·8 cm. in diam. (including the rays); peduncles 0·8–2·7 cm. long, copiously albo-tomentose. *Involucre scales* bluntly keeled, with the apices often slightly reddish brown; outer scales 2·5–4 mm. long, 1–1·5 mm. broad, ovate, acuminate; the inner 5–7 mm. long, 1·5 mm. broad, elliptic-ovate, much acuminate; the innermost 7–9 mm. long, 1 mm. broad, linear to linear-lanceolate, membranous, acuminate. *Ray florets* 9–13; lamina oblong to oblong-elliptic, broad, truncate, broadly 3-toothed; tube 3·5 mm. long, cylindric, becoming glandular hairy above. *Ovary* shortly pubescent, with retrose hairs; style 6 mm. long; branches 2 mm. long, obtuse. *Corolla-tube* of disc florets 6 mm. long, cylindric for two-thirds of its length, then abruptly campanulate, in some flask-shaped at the lower third, glabrous except just below the campanulate portion; lobes 0·5 mm. long, quite glabrous. *Ovary* shortly pubescent, with ascending hairs; style 6 mm. long, 2-branched; branches 2 mm. long, truncate and papillose, with the apices slightly enlarged. *Pappus bristles* persistent, sub-equalling the corolla-tube.

Shrub up to 30 cm. high and 46 cm. in diam.; leaves 0·5 to 1·3 cm. long, ascending, crowded, sub-acute with a distinct somewhat curved mucro, very densely glandular hairy with stalked glands on the upper surface, white-woolly below.

Distribution: Queenstown Div., summit of Andries Berg: *Galpin 2258*!, and in *Nat. Herb.* 2313!; Barkly East Div., summit of Doodman's Krans Mtn., *Galpin* 6694!, and in *Nat Herb.* 2312!, and in *Natal Govt. Herb.* 10364!; Herschel Div., Majuba Nek, near Sterkspruit: *Hepburn* 106! 237!.

(Both Galpin and Hepburn record this species as forming dense rounded cushions covering the mountains at high altitudes, 6800–9000 ft.—C. A. S.)

The Genus Melianthus.

By E. P. Phillips, M.A., D.Sc., and Joan Hofmeyr.

The genus *Melianthus* contains at least one species (*M. major*) which we know is poisonous to stock. Proot ot this has been furnished in the case of *Melianthus major* by Dr. H. H. Curson, M.R.C.V.S., of the Division of Veterinary Education and Research. Regarding the other species which occur in South Africa, we know very little. The species *M. comosus* has always been regarded as a poisonous plant, but no chemical work has been done on the genus, and according to Marloth, nothing is known about their chemical ingredients. Smith states that *M. comosus* is an antidote against snake-bite, and Marloth states that it "is said to yield a black, but otherwise tasty and harmless, honey."

The genus only contains six species, all confined to South Africa, and with the prospect that some investigator will take up the chemical investigation of the species, it was thought advisable to clearly define the species and map out their distribution as far as the available material allows. At the same time, this account of *Melianthus* partially completes the description of the family *Melianthaceae* as far as the South African species are concerned. (See *Bothalia*, Vol. I, pt. 1, for the genus *Bersama*.)

The genus was founded by Linneaus in 1735, and was based on the species *major* and *minor*. Sonder (*Fl. Cap.*, Vol. I) describes three other species, and in 1896 Bolus described a very distinct species from the Drakensbergen. Kuntze described a plant from the Drakensbergen as *M. insignis*, but a careful examination of specimens reveals no difference between this and *M. dregeanus*, except the larger flowers. Kuntze's species must, therefore, be sunk to a variety of *M. dregeanus*.

The six species enumerated below fall into two very well-defined groups, (1) those with whorled flowers on the peduncle and (2) those with solitary flowers at each node on the peduncle. The peculiar nectaries at the base of the calyx furnish well-defined diagnostic characters for the grouping of the specimens into species. In some the nectary is adnate to and lines the concavity formed by the two lateral sepals, while in others the sides of the nectary are free from the lateral sepals. This character was found useful in separating the two species *M. comosus* and *M. dregeanus*, which otherwise look so alike that they were confused in most herbaria. The fruit character given by Sonder as a specific difference, while it holds good, is not often seen in herbarium specimens.

The distribution of the species appears to be well marked, and as far as the available records go, the species do not appear to intermingle to any great extent. *M. comosus* is found all over the Karroo region. *M. dregeanus*, from Port Elizabeth northwards along a strip parallel with the coast until it reaches Natal; the variety *insignis* follows the Drakensbergen from Natal up to Barberton in the Transvaal. *M. villosus* is confined to the north-eastern portions of the Free State and *M. pectinatus* has not been recorded out of Namaqualand.

We are indebted to the Curators of the herbaria at the Transvaal, Albany, and South African Museums for the loan of material.

KEY TO SPECIES.

1.	Racemes with a single flower at each node	2.
	Racemes with 2–4 flowers at each node	3.
2.	Length of the nectary equalling the width of the lateral sepals and wholly adnate to the sepals at their base and with them forming a cup; petals shorter than the odd sepal	1. *dregeana*, Sond.
	Length of the nectary less than the width of the lateral sepals and adnate to them by its base only with the free portion forming a cup; petals equalling the odd sepal	2. *comosus*, Vahl.
3.	Petals longer than the sepals; leaves glabrous above, tomentose beneath	4.
	Petals shorter than the sepals; leaves quite glabrous or hairy on both surfaces	5.
4.	Ovary and fruit glabrous	3. *pectinatus*, Harv.
	Ovary and fruit densely hirsute	4. *minor*, Linn.
5.	Leaves glabrous and glaucous	5. *major*, Linn.
	Leaves hairy on both surfaces	6. *villosus*, Bolus.

1. M. dregeana, Sond.

A sub-woody shrub up to 2 m. high. *Branchlets* leafy at the ends. *Leaves* pinnate, 6–15 cm. long; rhachis winged; leatlets in 3–5 pairs, 2·5–6 cm. long, 0·7–2 cm. broad, elliptic, acute, with the margins deeply toothed with ovate acute teeth, and with the mid-rib prominent beneath, stellately hairy above, albo-tomentose beneath. *Stipules* 1·5–2 cm. long, narrowly ovate, tapering to a long fine point, clasping the stem at the base, thinly canescent. *Inflorescence* a pendulous raceme, 4–7 cm. long, bearing flowers for almost the whole of its length; peduncle about 1–5 mm. in diameter, albo-tomentose or densely pilose. *Flowers* solitary at the nodes of the peduncle, brick-red, with a maroon blotch at the base. *Bracts* 1·5–2 cm. long, ovate, acuminate, cordate at the base, mostly tomentose, sometimes pilose. *Pedicels* 1–1·8 cm. long, not much elongated in the fruiting stage. *Calyx* pubescent within and without; odd sepal 1·8 cm. long, 0·3 cm. broad at the base, lanceolate, acute, not saccate nor spurred; lateral sepals 1·5 cm. long, 0·2 cm. broad at the base, oblong, falcate, attenuated into a long point; upper sepals 2·3 cm. long, 1·3 cm. broad at the base, obliquely ovate-oblong, suddenly contracted at the apex into a short point, gibbous at the base. *Petals* 0·8–1 cm. long, 2 mm. broad; lamina spathulate, membranous, veined, glabrous; claw glandular and pilose on the inner surface, with woolly margins. *Nectary* equalling the width of the lateral sepals and wholly adnate to them at their base and with them forming a cup; end of nectary away from the stamens, with 3 or 4 teeth which are free from the lateral sepals. *Ovary* 4-angled, canescent, with the ovules in 2 rows; style persistent, pilose on the lower half. *Capsule* coriaceous, 6–7 mm. in diameter, depressed globose, obtusely 4-angled, densely tomentose, opening at the apex. *Seeds* 3 mm. in diameter, globose, black, shining, glabrous. *Fl. Cap., vol. i, p.* 368.

Distribution.—Albany Division: Grahamstown, *MacOwan* 264, and in *Natal Govt. Herb.* 725; Coldspring, *Glen* in *Natal Herb.* 6347; *Barber* in *Herb. Albany Museum.* Fort Beaufort Division: Hogsback Plateau, *Stayner* 9. Stockenstrom Division: Kalkberg, *Scully* 158, *Sole* 402. Stutterheim Division: Stutterheim, *Rogers* 12741. Queenstown Division: Bongolo Nek, *Galpin* 7967. East London Division: Fort Jackson, *Rattray* 817. Komgha Division: *Flanagan* 288; British Kaffraria, *Cooper* 106. Griqualand East: Cedarville, *Bander* 95. Without precise locality: *Atherstone* in *Herb. Albany Museum.*

Var. insignis, Phill. and Hofmeyr.

Similar to the species, but larger and densely pilose in all parts. *Leaves* 10–24 cm. long. *Stipules* 3–4 cm. long. *Leaflets* in 5–6 pairs, 4–8 cm. long, 1·5–2·8 cm. broad.

Inflorescence 4–7 cm. long, up to 4 cm. in diameter. *Bracts* 2·5–4 cm. long. *Pedicels* 2 cm. long. *Odd sepal* 3 cm. long, 7 mm. broad at the base ; lateral sepals 2·5 cm. long, 3 mm. broad, not attenuated into a fine point ; upper sepals 4 cm. long, 1·8 cm. broad at the base. *M. insignis*, Kuntze, *Rev. Gen.* iii, 2, p. 43.

Distribution.—Natal : At Altemooi, on the Drakensbergen, *Thode* in *Natal Herb.* 16466, and in *National Herb.* 2897. Transvaal.—Ermelo Division : Goede Hoop, *Pott* 4938, and in *National Herb.* 2898. Wakkerstroom Division : Wakkerstroom, *Van Dam* in *Herb. Transvaal Mus.* 22207.

2. M. comosus, Vahl.

A shrub up to 1·5 m. or more high. *Leaves* pinnate in the uppermost three-quarters, 6–16 cm. long ; rhachis winged ; leaflets in 2·5 pairs, 3–5 cm. long, 0·5–2 cm. broad, elliptic, acute, with the margins deeply and coarsely toothed with triangular acuminate acute teeth, and with the midrib prominent beneath, thinly stellately hairy above, canescent beneath. *Inflorescence* a pendulous raceme, bearing flowers almost the whole length ; peduncle about 1 mm. in diameter, hirsute. *Flowers* solitary at the nodes on the peduncle, dark red. *Bracts* 1–1·5 cm. long, broadly ovate, acuminate, cordate at the base, canescent. *Pedicels* 7 mm. long, elongating in the fruit. *Calyx* canescent without and within ; odd sepal 1·5 cm. long, 3 mm. broad, ovate-lanceolate, acute, not gibbous ; lateral sepals 1·5 cm. long, 2 mm. broad at the base, narrowly lanceolate, slightly falcate, acuminate ; upper sepals 2 cm. long, 1·2 cm. broad at the base, obliquely ovate, suddenly contracted to a short point at the apex, gibbous at the base. *Petals* 1·6 cm. long ; lamina spathulate, membranous, veined, glabrous ; claw pilose and glandular on the inner face of the upper portion, with woolly margins. *Nectary* joined to the lateral sepals at the base only, with the sides free, much shorter than the basal breadth of the lateral sepals. *Ovary* deeply 4-lobed, with the ovules in 2 rows, canescent ; style persistent, sparsely pilose. *Capsule* membranous, 3–5 cm. long, 4-winged, with the valves compressed and opening at the apex, canescent. *Seeds* 3–4 mm. in diameter, sub-globose, black and shining. *Fl. Cap. vol.* i, *p.* 367.

Distribution.—South-West Africa, *Dinter* 3520 ; Draai Kraal, *Pearson* 4995. Worcester Division : Cogman's Kloof, *Michell* 20 and in *National Herb.* 2893. Uitenhage Division : Philippstown, *E. and Z.* 777. Port Elizabeth Division : Hankey, *Paterson* in *Herb. Transvaal Mus.* 25698. Queenstown Division : Klaas Smits River, *Galpin* 2518. Calvinia Division : *Johanssen* in *Herb. S.Afr. Mus.* 4423. Ceres Division : Onder Bokkeveld, *Schlechter* 10933 ; Worcester Division : *Foley* 77, and in *National Herb.* 2895. Somerset East Division : Little Fish River, *MacOwan* in *Herb. Albany Mus.* Graaff-Reinet Division : Roodebloom, near Graaff-Reinet, *Bolus* 497. Murraysburg Division : *Tyson* 318. Middelburg Division : Culmstock, *Galpin* 5584 ; Naauwpoort, *Rogers* 12075. Colesberg Division : *Zeyher ; Rogers* 12078 and in *National Herb.* 2894 ; Britstown, *Page* in *Bolus Herb.* 14368. Aliwal North Division : Elands Hoek, *F. Bolus* 118. Bethlehem Division : Bethlehem, *Potgieter* 71 and in *National Herb.* 2896. Philippolis Division : Philippolis, *Marloth* 1917.

3. M. pectinatus, Harv.

A shrub. *Leaves* pinnate for almost their whole length, 6–16 cm. long ; rhachis winged ; leaflets in 6–11 pairs, 2–5 cm. long, 1–7 mm. broad, varying from linear to oblong and from lanceolate to elliptic, obtuse, with the margins reflexed and either entire or coarsely and shallowly toothed, glabrous above, tomentose beneath. *Stipules* 8 mm. long, linear, tapering to an acute apex, not amplexicaul, thinly tomentose. *Inflorescence* an erect raceme, 10–16 cm. long, bearing flowers in the upper portion ; peduncle 2 mm. in diameter, glabrous. *Flowers* in whorls of 2–4 on the peduncle. *Bracts* 1 cm. long, ovate, acuminate, thinly tomentose. *Pedicels* 1 cm. long, elongating in the fruit. *Calyx* green, varying from almost glabrous to thinly pubescent on both surfaces ; odd sepal 1 cm. long, 1 cm. broad, broadly-ovate, acute, gibbous at the base, lobed on either side at the middle ; lateral sepals 1·2 cm.

long, narrowly lanceolate, falcate; upper sepals 1·5 cm. long, 3 mm. broad, obliquely oblong, acute, slightly gibbous. *Petals* 2–3 cm. long; lamina elliptic, acuminate, membranous, veined, glabrous; claw densely hirsute on the margins, otherwise glabrous. *Nectary* horseshoe-shaped, joined to the odd sepal at its base, with the sides free. *Ovary* deeply 4-lobed, glabrous, with the ovules in 2 rows; style persistent, glabrous. *Capsule* 1 cm. long, membranous, 4-winged, opening at the apex, glabrous. *Fl. Cap., vol.* i, *addenda and corrigenda, p.* 21. *M. Trimenianus, Hook.* in *Trimen. Journ. Bot. N.S., vol.* ii, *p.* 353, *t.* 138; *Bot. Mag.* 6557.

Distribution.—Namaqualand Minor: Rietkloof, *Schlechter* 11180; Klipfontein, *Bolus* 9485, *Scully* in *Herb. Norm. Austro. Afric.* 1122.

4. M. minor, Linn.

A small shrub. *Leaves* 6–13 cm. long, divided in the uppermost two-thirds; rhachis winged; leaflets in 4–6 pairs, 2·5–5·5 cm. long, 0·5–1·8 cm. broad, lanceolate to elliptic, acute, with the margins toothed with acute teeth, and with the mid-rib prominent beneath, glabrous above, albo-tomentose beneath. *Stipules* 8 mm. long, narrow-lanceolate, joined to the base of the petiole, thinly canescent. *Inflorescence* an erect raceme 14–25 cm. long bearing flowers in the upper part; peduncle cylindric, about 3 mm. in diameter, canescent. *Flowers* in whorls of 2–4, dull red. *Bracts* 1·5–2 cm. long, lanceolate, narrowed into a long subulate point, canescent. *Pedicels* 1 cm. long, elongating in fruit. *Calyx* canescent without and within; odd sepal 1 cm. long, 5 mm. broad, ovate, acuminate, sometimes lobed on either side about the middle, gibbous; lateral sepals 1·2 cm. long, 2 mm. broad at the base, lanceolate-linear, very acute; upper sepals 1·8 cm. long, 8 mm. broad, obliquely ovate, tapering to an acute point. *Petals* up to 2 cm. long; lamina lanceolate, tapering to an acute point, membranous, veined, glabrous, with 2 narrow lobes near the base; claw pubescent and glandular on the inner surface, woolly on the margins. *Nectary* horseshoe-shaped, attached only at the base to the sepals with the walls free, sometimes with a small process on either side nearest the stamens. *Ovary* 4-angled, with the ovules in 2 rows, densely tomentose; style persistent, pubescent below. *Capsule* toughly membranous, 2 cm. long, sub-globose, 4-angled, tomentose. *Fl. Cap, vol.* i, *p.* 368.

Distribution.—Namaroup, Khamisberg, *Pearson* 6596. Van Rhynsdorp Division: Windhoek, *Schlechter* 8071; Olifants River, *Zeyher* in *Cape Govt. Herb.* Clanwilliam Division: Brackdam, *Schlechter* 8071, 11127. Malmesbury Division: Hopefield, *Bolus* 12645. Calvinia Division: *Leipoldt* in *Herb. Bolus.* Malmesbury Division: Between Hopefield and Saldanha Bay, *Bolus* 12645.

5. M. major, Linn.

A flexuous shrub up to 1·5 m. high. *Leaves* divided in the upper half or two-thirds; lower leaves 30–45 cm. long, upper leaves from 12 cm. long and upwards; rhachis winged; leaflets in 2–6 pairs, 9–18 cm. long, 5–7 cm. broad, oblong, acute, slightly narrowed at the base, with the margins deeply and coarsely toothed with triangular acute teeth, and with the mid-rib prominent beneath, glabrous, glaucous. *Stipules* 7–11 cm. long, elliptic-ovate, apiculate or acuminate, folding the leaf-petiole and amplexicaul at the base. *Inflorescence* a dense erect raceme, 30–38 cm. long, bearing flowers in the upper portion; peduncle cylindric, about 1 cm. in diameter, glabrous. *Flowers* brownish-red, in whorls of 2–4. *Bracts* 1·5–2·5 cm. long, ovate, sub-acuminate, glabrous. *Pedicels* 1·5–2 cm. long, elongating in the fruit. *Calyx* 5-parted almost to the base, pubescent without and within; odd sepal 1·4 cm. long, 1·4 cm. broad at the base, broadly ovate, suddenly contracted into an obtuse point, saccate or very shortly spurred; lateral sepals 2·5 cm. long, 7 mm. broad, obliquely ovate, narrowing upwards into an obtuse apex; upper sepals 3 cm. long, 1 cm. broad, obliquely ovate, narrowing upwards into an obtuse point, faintly gibbous at the base. *Petals* 1·5 cm. long, 2·5 mm. broad; lamina elliptic, membranous, veined, sparsely pilose; claw glabrous below, pubescent and glandular above on the inner face,

with woolly margins ; a fifth stamen sometimes present. *Nectary* lining the base of the odd sepal, with the sides free, erect, and strongly compressed, toothed at the end farthest from the stamens. *Ovary* deeply 4-lobed, with the ovules in 2 rows, glabrous ; style persistent, glabrous. *Capsule* membranous, 3–4 cm. long, deeply 4-lobed, valves sharply keeled, opening at the apex, glabrous. *Seeds* globose, 4·5 mm. in diameter, black, shining, glabrous. *Fl. Cap., vol.* i, *p.* 367.

Distribution.—Van Rhynsdorp Division : Gift Berg, *Phillips* in *Percy Sladen Memorial Expedition* 7630, and in *Herb. S. Afric. Mus.* 3271. Cape Division : Hout Bay, *Pappe*. Caledon Division : Houwhoek, *Elbrecht* in *Herb. Transvaal Mus.* 19014 ; Hottentot Hollands Mountains, *Zeyher*. Cape Division: Houts Bay, *Woolly Dod* 1520. Riversdale Division : near Heidelberg, *Galpin* 3798. Humansdorp Division : Clarkson, *Galpin* 3798. Somerset East : Boschberg, *MacOwan* 1560. Graaff-Reinet Division : Sneeuwberg, *Bolus* 1959. Specimens cultivated at Zomba, Nyasaland, *McClounie* in *Natal Govt. Herb.* 11247.

6. M. villosus, Bolus.

A shrub, stellately pubescent in all parts. *Leaves* divided in the uppermost three-quarters, 14–26 cm. long; upper leaves shorter than the lower; rhachis winged ; leaflets in 3–6 pairs, 4–14 cm. long, 2–4 cm. broad, elliptic-ovate, acute, with the margins deeply and coarsely toothed with triangular acuminate acute teeth, and with the mid-rib prominent beneath, sparsely stellately hairy above, densely stellately hairy beneath. *Stipules* 2–2·5 cm. long, obliquely ovate-lanceolate, tapering to an acute point. *Inflorescence* an erect raceme, 30-45 cm. long, bearing flowers in the upper part ; peduncle about 7 mm. in diameter. *Flowers* in whorls of 2–4. *Bracts* 2 cm. long, ovate, acuminate. *Pedicels* 2 cm. long, elongating in the fruit. *Calyx* pubescent within and without ; odd sepal up to 2 cm. long, 1 cm. broad, ovate, acuminate, sometimes lobed on either side about the middle, gibbous ; lateral sepals 1·8 cm. long, narrowly lanceolate, falcate, acute ; upper sepals 3 cm. long, 1·2 cm. broad, obliquely oblong, obtuse, not gibbous. *Petals* 1·6 cm. long ; lamina elliptic, membranous, not distinctly veined, pubescent ; claw densely hirsute and glandular, with woolly margins. *Nectary* joined to the odd sepal only at its base, with 2 free lobes, muricated between the lobes ; lobes oblong, obtuse, somewhat unequal ; shorter lobe acute ; longer lobe obtuse. *Ovary* 4-lobed, with the ovules in 1 row, densely hirsute ; style pubescent at the base. *Journ. Bot.* 1896, 17.

Distribution.—Natal : Weenen, *Wood* 4376 ; Giants Castle, *Symons* 1722 ; Elands River Valley, near the Mont-aux-Sources, *Flanagan* 2004.

A specimen collected by Colonel J. Rose in the northern parts of South-West Africa (*Herb. Bolus* 15462) is an undescribed species, but the material is too poor for drawing up a description.

An Undescribed Geocarpic Plant from South Africa.

By Sydney M. Stent.

Cucumis humofructus Stent sp. nov.

Plants monoecious. Flowers small, the male and female together in contracted racemes. ♂ flowers: pedicel slender, 4–20 mm. long, hairy, articulate below the calyx tube; calyx tube up to 5 mm. long, hairy with rather flaccid acute unicellular hairs, 1–2 mm. long, 10-nerved; lobes 5, about half as long as the tube, linear subulate, obtuse, with a few scattered long hairs; corolla-tube equalling and confluent with the calyx-tube, without scales inside; lobes 5, cut down nearly to the calyx-tube 2–4 mm. long, ovate, obtuse, pappilose with short gland-tipped hairs, more densely so on the back and with some long acute hairs on the nerves; mid-nerve excurrent into a short blunt gland-like mucro. Stamens 5, inserted on and completely included in the tube, 4 connate in two pairs, 1 free; filaments very short; anthers 1-thecous sparingly and shortly ciliate: thecae conduplicate; connectives produced into lanceolate sub-acute appendages, those of the connate anthers free or more or less cohering; rudimentary ovary a cushion-like gland. ♀ flowers: pedicel very short and stout, lengthening and enlarging and arching downwards, finally forcing the acute ovary deeply into the ground; calyx and corolla as in the male; ovary inferior, narrow ovoid, contracted into a neck about as long as the calyx-tube, densely hispid with appressed retrose hairs, 3-chambered; ovules many, horizontal; style short; stigma 3-lobed, with the lobes lanceolate obtuse; disc annular; staminodes 3. Fruit a whitish berry, globose to ovoid globose, about the size of an orange; seeds numerous, white, oval, smooth, compressed, emarginate, about 18 mm. long, embedded in white jelly-like pulp. Stems prostrate and trailing, often rooting from the nodes, hairy-angular. Leaves entire, broadly ovate to sub-rotundate, obtuse to sub-acute and apiculate, obtusely angled, minutely ciliate and gland-toothed, scabrid with sharp tubercle based hairs, cordate at the base, 6–12·5 cm. broad and about as long; petiole rough hairy, up to 5 cm. long. Tendrils simple.

Farm Roodepoort, Naboomspruit, Waterberg, Transvaal: *Galpin* M. 146.

Grown at Botanical Laboratories, Pretoria (*Nat. Herb.* 2866).

This interesting plant was grown from seed taken from a fruit sent to the National Herbarium by Mr. E. E. Galpin (*Galpin* M. 719), of Naboomspruit, Waterberg, Transvaal. In his letter Mr. Galpin says: "I send you a curious gourd which is produced underground and resembles a tuber: it was brought to me by natives working in my lands . . . the natives describe it as bearing trailing stems about 3 ft. long, rooting at the nodes like a sweet potato, and bearing potatoes which have seed inside them like a pumpkin. They state the fruit is not edible but is used as medicine."

Fruit of this plant was first sent to the Herbarium in 1910 by the late Mr. Eddie Meintjes, who found it lying on a ploughed field at Potgietersrust, and in 1914 by Mr. W. Meyer, of Cullinan. (The photographs of the fruit and seed were taken from Mr. Meyer's specimen.) Attempts to germinate the seed failed. Later I visited a farm near Naboomspruit and questioned the natives about this gourd; they most of them knew it, but could not describe the plant. Some years later a fruit was again sent to the Herbarium and the seeds were sown; this time they germinated, but the young plants died off without flowering.

In 1923, Mr. Snyman, of Grootfontein, South-West Africa found the plant growing in sand in South-West Africa, and submitted fruits to the Division of Botany for identification; these were sent to Kew, but were quite unknown to the authorities of that institution, who suggested that the fruit had not developed underground, but had been

Cucumis humofructus Stent.

A.--Pistillate flower (much magnified).

B.—Staminate flower (much magnified).

buried by natives for the purpose of preserving it for future use. This theory, however, was not supported by the evidence of correspondents who had sent the fruit. Finally plants were more or less successfully raised from the seed from Mr. Galpin's fruit, and though the plants died off before the fruits could mature they developed sufficiently for the purpose of diagnosis.

The plant resembles a typical *Cucumis* except that the male and female flowers are borne in the same axil, the female at the base of the short contracted raceme, not a usual character in the genus.

Cucumis humofructus Stent.

Flores parves, racemosi. Fl. ♂ pedicellus gracile 4–20 mm. longus, hirsutus; calycis tubus ad 5 mm. longus, 10-nervatus, hirsutus, pilis flaccidis, acutis, 1·2 mm. longus; lobi 5, circ. 2 mm. longi, lineare-subulati, obtusi, pilis longis sparsis. Corollae tubus calycis tubis equans et cum eo confluens; lobi 5 ad tubis partiti, 2–4 mm.

[*Photo by H. H. Storey.*

Cucumis humofructus, Stent, growing on Mr. Galpin's farm at Naboomspruit.

longi, ovati, obtusi, utrimque pilis glandulis brevissimis dense vestatis, costae dorsis in minutis obtusis mucronis glanduliformis productae. Staminae 5, tubo calycis insertae, 4 in paris connatis, 1 libra, tubo calycis inclusae; antherae 1-loculare; loculi conduplicati sparse breviterque ciliati; connectivus in apice lanceolato productus; ovarium rudimentum glandula pulveniforme. Fl. ♀ pedicellus brevissimus validusque, mox elongatus, rigide ad terram in arcum curvatum; calyx et corolla maris. Staminum rudimenta 3, parva; stylus disco annulari insertus, stigmatis 3-lobatis; lobi lanceolati, obtusi. Ovarium anguste ovoideum in collum contractum, pilis appressis retrorsis dense hirsutum, 3-loculis; ovulis ∞, horizontalis. Fructus baccatus corticatus intra terram maturescens, globosus vel ovoideus, circ. 7·5 cm. diam. albidus vel albo-luteus, rugosus, ∞-spermus; semina, ovalia, compressa, laeva, immarginata, circ. 2 mm. longa. Caules reptates, hirsutes, angulares, saepe radicibus nodibus. Folia petiolata; petiolus hirsutus, ad 5 cm. longus; lamina integra, late ovata vel sub-rotundata, setis brevissimis ab turberculis ortis scabrida; margines minute ciliatae, glandulo-dentatae et obtuse angulatae; basis cordata, apex obtusus vel sub-acutus, breviter apiculatus. Cirrhi simplices.

Seeds of *Cucumis humofructus.*

Fruit of *Cucumis humofructus.*

[*Photo by I. B. Pole-Evans.*

Four Interesting Species of Compositae.

By C. A. Smith, B.Sc., Division of Botany, Pretoria.

Three of the species described below were collected by Dr. J. Muir in the Riversdale District, Cape Province; while the fourth was collected by the writer at Pretoria.

Two of the species, viz., *Tripteris glabra* and *Euryops Muirii*, were of particular interest as they exhibited characters which do not conform to the published descriptions of the genera.

In the *Tripteris* the achenes exhibit apical prolongations which resemble a pappus, but a careful examination shows these to be merely elongations of the marginal angles. In the ray florets the typical cup-like apex to the achene is seen, but more pronounced than in most species, while the other characters, too, agree with those of the genus, and there can be no doubt that the plant must be placed under *Tripteris*.

The *Euryops* differs from most species of the genus by having the involucral scales connate at the base only, but otherwise it agrees quite well with other members of this genus.

It was at first thought that the *Oedera* was *O. laevis* DC., a species not collected since Burchell's time, but as it differs in many essentials from the published descriptions of this species, it was thought advisable to regard it as an undescribed species.

Euryops Muirii, C. A. Smith, sp. nov. (Compositae) a *E. Candollei,* Harv. affinis, sed apice foliorum recto differt.

Suffrutex perennis, rigidus, ramosus, 15-25 cm. altus. *Rami* glabri. *Folia* sessilia, imbricata, 2-5 mm. longa, 0·5 mm. lata, linearia, apice sub-acuta mucronataque (apex aliquando foliis adultis pennicillatus), basi latioria, carinis crassis convexisque, glabra. *Capitula* heterogama, solitaria, pedunculata, ad apice ramorum conferta; pedunculus 0·4-1 cm. longus. *Involucrum* supra 2 mm. latum; bracteae sub 1-seriatae, basi connatae gibbosaeque, 3 mm. longae, 0·5-2 mm. latae, lanceolatae vel obovatae, apice obtusae vel acutae, pungentes, marginibus scariosis, integris, glabrae. *Receptaculum* 1·5 mm. latum, convexum, alveolatum, marginibus alveolorum productis. *Flores radii* flavi, 5, femines. *Tubus corollae* glaber; lamina ovata, apice 3-dentata, basi angustata. *Ovarium* sub-teres, pubescente; stylus 1·5 mm. longus, cylindricus, glaber; rami plani, lineares, apice obtusi. *Pappi setae* pluriseriatae, caducae, barbellatae. *Flores disci* fertiles, 8-10. *Tubus corollae* 2·5 mm. longus, infra cylindricus, supra campanulatus et 1 mm. latus, glaber; lobi 0·55 mm. longi, subtriangulari, apice obtusi. *Stamina* latiore parte tubi corollae inserta; antherae 1 mm. longae, basi obtusae, apice appendice sub-acuto lanceolato instructae. *Ovarium* sub-teres, basi angustatum, pubescente; stylus 2 mm. longus, cylindricus, glaber; rami 0·5 mm. longi, plani, apice truncati, pennicillati. *Pappi setae* flores radii similes.

South Africa.—Cape Province, Riversdale District: Hills at Melkhoutfontein near Stil Baai, September 1920, *Muir* 2453, and in *Nat. Herb.* 2900.

Note.—The specimen differs from published generic descriptions of *Euryops* in that the involucral bracts are not truly in 1 row, and are distinctly connate at the base only, but in all other characters it agrees with *Euryops* so closely that I have decided to place it in this genus.—C. A. Smith.

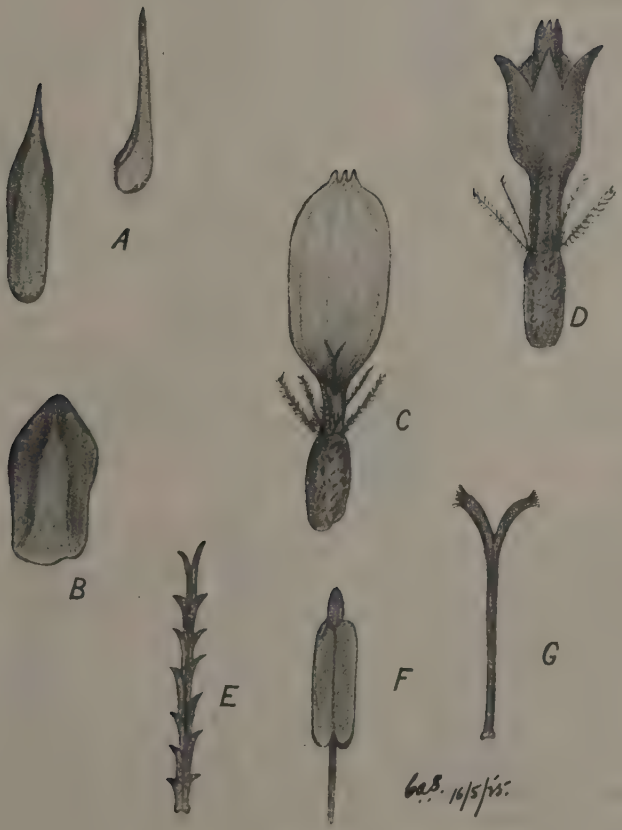

Fig. 5.

Euryops Muirii, C. A. Smith, sp. nov.

A and B.—Involucral bracts.
C.—Ray floret with achene.
D.—Disc floret with achene.
E.—Single pappus bristle.
F.—Anther of disc floret.
G.—Style of disc floret.

*__Tripteris glabra,__ C. A. Smith, comb. nov. (Compositae), a spp. *Triptere* costis ovarium productis differt.

Suffrutex perennis, ramosus, 75 cm. altus. *Rami* prope basim ramosi, infra nudi, supra foliis confertis, glabri, multis cicatricibus foliorum tecti. *Folia* sessilia, 0·9–1·2 cm. longa, linearia, triquetra, apice fusca vel nigra vel (foliis adultis) alba, pungentia, basi amplexicaulia, breviter decurrentia, integris marginibus, glabra. *Capitula* radiata, solitaria, terminalia. *Pedunculus* 0·5–0·8 cm. longus. *Involucri bracteae* sub 1-seriatae, librae, 1·3 14 cm. longae, 0·3 cm. latae, lanceolatae, apice pungentes, marginibus scariosis, et carinis processis rigidis onustis. *Receptaculum* 3·5 mm. latum, convexum nudumque. *Flore radii* femines. *Tubus corollae* sparse glanduloso-pilosus ; lamina lutea, ligulata, oblongo-elliptica, apice 3-dentata, basi angustata. *Ovarium* trigonum, apice in calyculo instructum, margine in 2–3 setis (0·5 mm. longis) producto, glabrum ; stylus 3·5 mm. longus, cylindricus, glaber ; rami 1 mm. longi, lineares, apice obtusi. *Flores disci* plures, steriles. *Tubus corollae* 5 mm. longus, infra cylindricus, glaber, supra latior, glanduloso-pilosus ; lobi 1 mm. longi, triangulares, apice acuti, et posterior breve cornutis, glabri. *Stamina* supra parte angustato tubi corollae inserta ; antherae 2·5 mm. longae, basi caudatae, apice in lanceolato-sub-acuto appendice instructae. *Ovarium* 4-angulatum, glabrum, angularis in 4–5 aequalibus vel inaequalibus setis productis ; stylus 4 mm. longus, cylindricus, breviter bifidus, glaber ; stigma exteriore convexum pubescenteque.

South Africa.—Cape Province, Riversdale District : Hills near " Muiskraal," August 1923, *Muir* 2683, and in *Nat. Herb.* 2899 ; *Galpin* 4217, and in *Nat. Herb.* 2930.

Note.—This plant was described by N. E. Brown (Kew. Bul. 1901, 125) as *Osteospermum glabrum*, but a careful examination of further material furnished by Dr. John Muir, of Riversdale, shows that the achenes are beaked, which would place it in the genus *Tripteris*.

Oedera Muirii, C. A. Smith sp. nov. (Compositae), a *O. laevis*, DC. affinis sed in oppositis foliis differt.

Suffrutex erectus, rigidus, ad 45 cm. altus. *Rami* lanati, supra foliati, infra nudi, argentei, cicatrisati, cicatricibus lanatis. *Folia* opposita, sessilia, concava, minute striata, apice mucronata, basi latiora et lanata, marginibus serratulo-lanatis, utrinque glabra, nitida ; folia infra capitulum 1·5 cm. longa, 4 mm. lata, oblongo-linearia ad anguste elliptica, alioqui 4–5 mm. lata et ovato-lanceolata. *Capitula* ad 18, cylindrica, breviter pedunculata, 0·8 cm. longa, 2 mm. lata ; pedunculus 2·5 mm. longus, lanatus. *Involucri bracteae* multiseriatae ; exteriores 1·5–4 mm. longae, ovatae, apice acutae, mariginibus scariosis ; interiores 1–1·15 cm. longae, ampliter oblongae, marginibus integris scariosisque. *Receptaculum* parvum, linearibus scariosis glandulosis paleis (1·1 cm. longis) onustum. *Flores radii* solitares, flavi, femines. *Tubus corollae* 2 mm. longus, glaber ; lamina oblonga, integra vel dentata, basi cuneata. *Ovarium* lineare, angulatum, glabrum ; stylus 2·5 mm. longus, cylindricus, glaber : rami 1 mm. longi, lineares, plani superne, inferne convexi, apice truncati pennicillatique. *Flores disci* 8–9, hermaphroditi, steriles. *Tubus corollae* 4 mm. longus, infra cylindricus, supra campanulatus, glabra ; lobi 0·5 mm. longi, sub-triangulares, apice acuti. *Antherae* 1·5 mm. longae, basi obtusae, apice, appendice subacuto lanceolato-lineare instructae. *Stylus* 3 mm. longus, cylindricus, apice truncatus et breviter bifidus, pennicillatus glaber.

South Africa.—Cape Proivnce, Riversdale District : Near Garcia's Pass, October, 1923. *Muir* 2901.

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* After this paper had gone to press and while correcting the proofs, Mr. H. G. Fourcade, of Witte Els Bosch, Humansdorp Div., sent me a specimen [Fourcade 3111, and in Nat. Herb. 3437] identified as *Osteosperum triquetrum*, Linn. f., but a careful examination of the material showed that it had to be placed under *Tripteris glabra*, C. A. Smith, differing from this only in that the involucre scales are smooth, and the ovaries of the ray florets are furnished with stalked glands in the upper half. In my opinion these two characters warrant the creation of a distinct variety of *T. glabra*, and I propose the name : *Tripteris glabra*, C. A. Smith, var. *glandulosa*, C. A. Smith.

South Africa : Cape Province, Humansdorp Dist. : Flats and hlls north of Kouga River, " Vaal-fontein," September, 1925, 1,700 ft., Fourcade 3111, and in Nat. Herb. 3437.

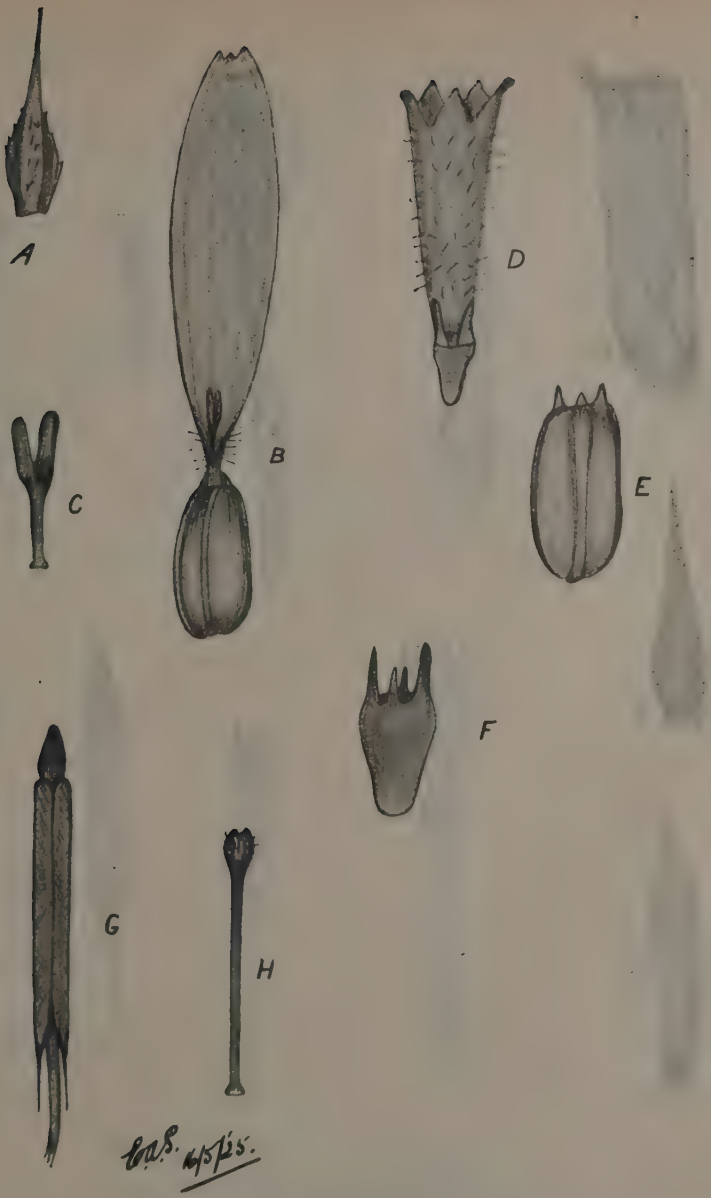

Fig. 4.

Tripteris glabra, C. A. Smith, sp. nov.

A.—Involucre scale.
B.—Ray floret with achene.
C.—Style of ray floret.
D.—Disc floret with sterile achene.
E.—Ray achene (fertile).
F.—Sterile disc achene.
G.—Anther of disc floret.
H.—Style of disc floret.

Fig. 6.

Oedera Muirii, C. A. Smith, sp. nov.

1.—Single head from a glomerule.
2 and 3.—Outermost and innermost bracts respectively.
4.—Ray floret with achene and pappus.
5.—Pappus of ray floret.
6.—Style of ray floret.
7.—Cauline leaf.
8.—One of the floral leaves.
9.—Disc floret with pappus and sterile achene.
10.—Pappus of disc floret.
11.—Anther of disc floret.
12.—Style of disc floret.

Dicoma pretoriensis, C. A. Smith, sp. nov. (Compositae); a *Dicoma Zeyheri*, Sond. affinis, sed habitu et foliorum formis differt.

Suffrutex depressus, compactus; radix perennis, crassus, lignosus. *Rami* prope basim ramosi, ad 5 cm. alti, striati, caulescentes. *Folia* sessilia, conferta, 1·7–3·5 cm. longa, 0·6–2 cm. lata, late oblongo-elliptica, apice acuta vel obtusa, aliquando sub-acuminata, basi cuneata, amplexicaulia, superne glabra, inferne dense tomentosa, nervis lateralibus 2–4 ascendentibus, marginibus sparse et minuta dentatis. *Capitula* homogama, solitaria, terminalia. *Involucri bracteae* circa 12-seriatae, coriaceae, late ovatae, pungentes; exteriores 0·8–1 cm. longae, 0·5–0·7 cm., latae; interiores 1·2–1·5 cm. longae, 0·8–0·9 cm. latae, marginibus scariosis; intimae albido-membranaceae. *Receptaculum* 6 mm. latum, leviter concavum, fimbrillis onustum. *Tubus corollae* 8 mm. longus, infra cylindricus, supra gradatim latior (2 mm. latus) glaber; lobi 3·5 mm. longi, lineares, supra angustati, obtusi, interdum reflexi. *Stamina* supra parte angustato tubi corollae inserta; antherae 5·5 mm. longae, basi caudatae, caudis pilis retrorsis vestitis, apice in ovato subacuto appendice instructae. *Ovarium* dense villosum; stylus 8 mm. longus, cylindricus, glaber, ramis 1·5 mm. longis, exteriore facie convexis et pubescentibus, obovatis, apicis obtusis. *Pappi setae* densae, 6 mm. longae, similares, albae plumosae.

South Africa.—Transvaal; Pretoria District: Pretoria, April, 1925, *Smith* 147, and in *Nat. Herb.* 2892.

A New Cyperus from the Transvaal.

By A. P. D. McClean, M.Sc., Division of Botany, Pretoria.

Cyperus Thorncroftii, McClean, n. sp.

Planta glabra. *Stolones* 0. *Culmi* 15–23 cm. longi, caespitosi, basi vaginis senicibus incrassati, teretes vel sub-compressi, costati, glomerulis parvis rhizomate brevi confertis. *Folia* culmis subequales, viridia, setacea, marginibus involutis et sparse scabridis, glabra; vaginae rufo-fuscae, scariosae, costatae, marginibus hyalinis. *Bracteae* 2, foliis consimiles; inferior ad 13 cm. longa. *Inflorescentia* umbellata. *Spiculae* 6–35, sessiles, 1–2·5 cm. longae, 3 mm. latae, lineares, fuscae; glumae ad 50, imbricatae, tandem patentes, naviculares, oblongae, basi truncatae, apice orbiculatae et minute bilobatae, carinis pallidis prominentibus in brevi acuto mucro productis. *Rhachilla* compressa flexuosa, non alata, marginibus crassis. *Stylus* nucem subequalis; rami nuce longiores. *Nux* $\frac{1}{3}$–$\frac{1}{2}$ parte glumae aequilonga, trigona, obovoidea, fusca.

Transvaal: Barberton district, *G. Thorncroft* 39, and in *National Herb.* 2889.

Belongs to sub-genus *Pycnostachys*—comes nearest to *C. parvinux* C.B.Cl. (ex descr.), but differs from this species in the size of the bracts, in the number and size of the spikelets, and in the shape of the glumes and in other minor characters.

This plant was submitted for report to Dr. S. Schönland, who thought it an undescribed species, and this view was subsequently confirmed by Kew.

K. A. Lansdell.

Cyperus Thorncroftii McClean.

Plant reduced to two-thirds; A, young spikelet × 4 (in right-hand figure spikelet more mature and showing glumes opening out); B, and C glumes; D, flower.

Description of Three New South African Plants.

By E. P. Phillips, M.A., D.Sc., F.L.S., F.R.S.(S. Afr.).

Pseudoscolopia, Phillips gen. nov. (*Flacourtiaceae*) *Flores* hermaphroditi. *Segmenta calyci* 4, valvata, persistentia. *Petala* 4, cum sepalis sub-similes, imbricata, persistentes. *Stamina* ∞ ; filamenta libra ; antherae erectae. *Ovarium* librum, 1-loculare ; placentae 2, parietales ; ovulum 1 in quaque placenta ; stylus teres, apice bilobatus. *Capsula* 2-valvata, ovidea, acuminata, apice stylis coronata. *Semnia* ellipsoidea, pilis stellatis vestita ; embryo rectus, cotyledones frondeae ; albumen sparsum.

Arbor parva ; folia opposita ; stipulae 0 ; flores axillares, in cymis parvis ; cymae foliis breviores.

P. Fraseri, Phillips sp. nov. *Folia* 3–6 cm. longa, 1·3–3·5 cm. lata, serrata, apice rotundata vel sub-acuminata, obtusa vel sub-acuta, glabra ; petiolus 5–8 mm. longus. *Sepala* 5·5 mm. longa, 1·5 mm. lata, oblonga, apice obtusa, hubescentia. *Petala* 5·5 mm. longa, 1·5 mm. lata, oblanceolata, apice obtusa, tomentosa. *Filamenta* 2 mm. longa, filiformia, glabra ; antherae 0·5 mm. longae, oblongae. *Ovarium* ovoideum, pilosum ; stylus 3 mm. longus, apice bifidus. *Capsula* 1 cm. longus ; valvus acuminatus. *Semina* 4·5 mm. longa.

Pondoland : Ntsubane Forest, *Fraser in National Herbarium* 1417 and *in Herb. Forest Department* 3133.

Forester Fraser states," So far, I have only seen this species within 100 yards of the edge and on the edge of the Ntsubane Forest. I have not seen it in any other forest. It appears that its habitat is on the edge and not in the denser forest. The largest tree observed measured about 15 ft. high and 3 ft. 10 in. in circumference, and this was about thirty yards within the forest and on a steep slope. The bark is rough and flakey, and the timber does not appear to be put to any particular use." In a later letter Forester Fraser states, " I have now come across several small individuals growing well in the forest among taller timber trees."

Keetia, Phillips, gen. nov. (*Rubiaceae*). *Calyx* supra discum tubis latis producta ; dentes 5, parva, tubis breviores. *Tubus corollae* campanulatus, intus pilis reflexis obtectus ; lobi 5, ovati, reflexi, tubis longiores. *Discus* in fauce calycis submergus. *Stamina* in fauce corollae affixa ; antherae filamentis longiores. *Ovarium* 2-loculare ; ovulum 1 in quaque locula ; stylus exsertus ; stigma ellipticum, distinctis 3-sulcatum, basi truncatum. *Fructus* drupaceous, sub-didymus, interdum 1-locularis ; embryo rectus, fuscis duris albuminis circumvestus.

Frutex, scandens ; folia opposita, integra ; stipulae ovatae, longo-acuminatae ; flores in cymis axillaris.

(Named in honour of Mr. J. D. Keet, Conservator of Forests, Transvaal.)

K. transvaalensis, Phillips sp. nov. *Ramuli* fulvo-tomentosi. *Folia* 4–13 cm. longa, 2·8–5 cm. lata, ovata, oblonga, ovato-oblonga, oblongo-lanceolata, vel elliptica, apice acuminata, acuta vel obtusa, glabra vel pilis sparsis vestita, subtus nervis prominentibus; petiolus 0·5–1·3 cm. longus, glaber vel tomentosus. *Stipulae* ovatae, longo-acuminatae, deciduae. *Inflorescentia* densa, axillaria, foliis brevioria. *Pedicelus* 4 mm. longus, pilosus. *Tubus calyci* brevior, dentatus, pilosus, *Tubus corollae* 4–5 mm. longus, cylindricus, extus glaber; intus fauce infra pilosus; lobi 1–5 mm. longi, oblongi, apice obtusi. *Filamenta* tubis calyci aequalia; antherae exsertae. *Ovarium* pilosum; stylus 0·9–1 cm. longus; stigma 2 mm. longum, oblongum, apice leviter divisum, 3-sulcatum. *Fructus* 0·9 cm. longus, 1·2 cm. latus, plerumque didymus.

Transvaal: On edge of high forest De Hoek, Pietersburg District. Common on bushes along edge of forest *Keet* 1181; Woodbush Forest *Botha* in *Herb. Forest Dept.* 2949; Ivy Range, Moodies, Barberton District. A climber, found in bush, *Thorncroft* 372; Woodbush Forest *Doidge in National Herb.* No. 6070; Woody Ravines, Barberton—Climbing up the highest forest trees; flowers creamy white, *Galpin* 519; Natal, edge of wood near Pinetown, 1100 ft. *Wood* 5477 (or 5377 ?); Barotseland, Sesheke, *Borle* 293; Portuguese East Africa, 25-miles station (near Beira), *Schlechter* 12290.

Theilera, Phillips, gen. nov. (*Campanulaceae*). *Calyx* 5-partitus; lobi auguste subfoliacei. *Tubus corollae* cylindricus; limbus patens. *Stamina* 5, tubo corollae libra; filamenta basi tenuia. *Ovarium* inferior, obovoideum, 3-loculare, ovulis paucis in quaque loculo; stylus exsertus, filiformis, glaber; stigma ellipsoideum, 3-fidum; lobi oblongi.

Suffrutex laxus; rami tenues, longi; folia alternata, fascicula; flores sessiles, solitares, axillares vel terminales.

(Named in honour of Sir Arnold Theiler, K.C.M.G.)

T. Guthriei, Phillips, comb. nov. = *Wahlenbergia Guthriei*, *L. Bolus in Ann. Bolus Herb. vol. i, p.* 193.

To the collectors given by Mrs. Bolus, add "Knysna, Plat Bos, Farleigh Forest Reserve, and also in virgin veld (common), *Keet* 969; Buffels Mtn. Plantation, *Keet* 482; Mossel Bay, slopes of Goliath's Berg, *Muir* 2052; George, mountains above George, *Theiler in Herb. Theiler.*

Botkalia II. pk. 2. 1928.

THE SOUTH AFRICAN SPECIES OF THE MELIOLINEAE.

By E. M. Doidge and H. Sydow.

THE SOUTH AFRICAN SPECIES OF THE MELIOLINEAE

By E. M. Doidge and H. Sydow.

The earliest knowledge of the South African species of the *Meliolineae* is due to the collections of MacOwan and Medley Wood, which were described for the most part by Kalchbrenner and Cooke (3, 14–15), and to descriptions of later collections published by Sydow (17–19).

In an account of the South African Perisporiales published in 1917 (4), some 32 species were mentioned, and since that date a considerable number of South African *Meliolineae* have been described in various publications (5–10, 19, 24, 26).

The type specimens of fungi collected in other parts of the world, are not easily accessible to workers in South Africa. The revision of a group of fungi can therefore be most effectively accomplished in collaboration with a mycologist in Europe, who is familiar with species from all parts of the world and has access to most of the type species. The present revision is the result of such a collaboration, and includes descriptions of 72 species belonging to four genera.

GEOGRAPHICAL DISTRIBUTION.

The distribution of the *Meliolineae* in South Africa corresponds to a large extent with the distribution of the indigenous timber forests; that is to say, they are found mostly on the seaward slopes of mountains within less than 100 miles of the coast. A few species have also been found in scattered bush in kloofs and ravines further inland; the scrub forest near the coast also yields a number of species.

The largest forest area is in the Cape Province, between the Outeniqua Mountains and the sea, and extending from George, through Knysna to the Humansdorp Division. *Meliolineae* are plentiful in these forests, and a number of collections have been made in different localities.

In the Eastern Conservancy, the Pirie Forest in the neighbourhood of Kingwilliamstown has, on two or three occasions, been explored for fungi of this group, but very little systematic collecting has been done in the forests of the Transkei, Natal (except the Karkloof) and Zululand. It is more than likely that there are many species in these forests still unknown and undescribed. The Woodbush forests in the Transvaal have also yielded a number of interesting fungi.

The individual species are not as a rule, confined to certain definite localities, but their geographical range appears to be coincident with that of the host plant. For example, *Meliola ganglifera* may be found wherever the Assegai (*Curtisca fuginea*) grows, and certain species on yellow-wood (*Podocarpus spp.*), and on black ironwood (*Olea laurifolia*) occur wherever these trees are found from the Cape to Natal and in the Northern Transvaal.

TAXONOMIC.

The *Meliolineae* is a group of fungi with extremely wide geographic distribution in the warmer countries of the world, and consists of a small group of genera with the characters originally described for the genus *Meliola*. They are superficial fungi with a conspicuous and characteristic mycelium, spherical perithecia (except in *Amazonia* where they are dimidiate at maturity), and comparatively large 3–4 septate, brown spores.

The genus *Meliola* was established by Fries (11) in 1825, and in 1851 the first general discussion of the genus was given by Bornet (2): six species were then known. Gaillard's monograph, "Le Genre Meliola" (12), included 111 species.

In the majority of the species of *Meliola* the mycelium is furnished with characteristic capitate hyphopodia, but in a few species these are absent or rudimentary. In 1914, Sydow (20) separated these species from the genus *Meliola*, under the generic name *Meliolina* (Type *M. cladotricha* Lev.); and in 1917 the genus *Irene* was established by Theissen and Sydow (21) for *Meliola* species with mycelium and perithecia devoid of setae, the type being the South African species *Irene inermis* (K. and C.), Th. et Syd.

The genus *Amazonia* Theissen (22) comprises a few species with typically *Meliola*-like mycelium and spores, but with perithecia which are dimidiate at maturity. On account of the form of the perithecia this genus was placed in the family *Microthyriaceae* (22, 23), but van Höhnel has shown (13) that under the brown shield-like cover a completely closed perithecium, pale and thin-walled, exists. This can therefore be properly regarded as a transition genus between *Meliola* and the *Microthyriaceae*.

Certain species included by Theissen and Sydow in the genus *Irene*, have curious vermiform appendages on the perithecia. This was regarded by van Höhnel (13A) as a distinction of generic importance, and he established for them the genus *Appendiculella* [Type *A. calostroma* (Desm.) v. Höhn.].

In 1920 Beeli (1) gave a synopsis of 459 species, including a fifth genus (*Meliolinopsis*, asci persistent, 8-spored) and introduced an extremely useful system of group numbers.

The monograph published by Stevens (16) in 1927-28, brought up the number of known species to close on 1,000; these species he classified under seven genera. In addition to those mentioned above (but excluding *Meliolinopsis*) he included *Actinodothis* Syd. (Phil. Jour. Sci. Bot. 9, 1914) with dimidiate perithecia and no free mycelium. The genus *Appendiculella* v. Höhn. is regarded by Stevens as synonymous with *Irene* Theiss. and Syd. on the grounds that the perithecia of the type species of the genus *Irene* (*I. inermis*) possess vermiform appendages.

Irene inermis is a species indigenous to South Africa and it has been possible to examine abundant material from different localities. The outer walls of the perithecial wall are extremely irregular and protuberant, many of them being produced into irregularly conical or horn-shaped processes up to 25 μ long, [not as long as 60 μ as previously stated (1)]. These, however, are not typical vermiform appendages, such as are found on perithecia of *Appendiculella calostroma*. If it is intended, therefore, to maintain the smaller Meliolaceous genera, it would be preferable to retain van Höhnel's original nomenclature.

Stevens has further established the genus *Irenopsis*, to include species without mycelial setae, but with true setae (not vermiform appendages), on the perithecium.

Both these genera, namely, *Appendiculella* and *Irenopsis*, can only be regarded as weak genera. In the case of *Appendiculella* there are too many transitions between forms with larviform appendages and forms devoid of such appendages, so that as in the case of *Irene inermis*, there may be difference of opinion as to whether a species should be placed in one or the other genus. In the case of *Irenopsis* there are species with perithecial setae which also have mycelial setae and are classified with the Meliolas; the species with perithecial setae are thus divided between the two genera.

We have preferred, therefore, in the present revision, to reunite *Appendiculella* with *Irene*, and *Irenopsis* with *Meliola*, retaining only the genera *Amazonia*, *Meliolina*, *Irene* and *Meliola*. It is doubtful whether the genus *Amazonia* can logically be maintained, as there are a number of transition forms between species with globose, and species with typically dimidiate perithecia. *Meliola Goniomae* is a case in point: this species was originally described as an *Amazonia*, the immature perithecia being distinctly dimidiate, but as these usually become globose at maturity, this fungus more properly belongs to the genus *Meliola*. The position of the genus, however, is left for future consideration after a larger number of species has been examined.

ACKNOWLEDGMENT.

Our thanks are due to the staff of the National Herbarium, and particularly to Miss I. C. Verdoorn and Mr. C. A. Smith for considerable assistance in revising the nomenclature of the host plants.

EXPLANATORY.

The numbers given in square brackets are those of the Cryptogamic section of the National Herbarium.

The formulae at the beginning of each description are those of the extremely useful system of group numbers introduced by Beeli (1) and modified by Stevens (16).

The significance of these numbers is as follows :—

I. Main characters (numbers at left of period).

(1) Spores.
- 1.....2 septate.
- 2.....3 septate.
- 3.....4 septate.
- 4.....5 septate.

(2) Perithecia.
- 1.....With no setae or vermiform appendage.
- 2.....Bearing thick, cutinised vermiform appendages.
- 3.....Bearing uncinate or spiralled setae.
- 4.....Bearing setae, not uncinate or spiralled.

(3) Mycelial setae.
- 0.....Absent.
- 1.....Simple, entire, straight or nearly so.
- 2.....Simple, entire, but uncinate.
- 3.....Dentate, notched or forked (teeth less then 40 μ long).
- 4.....Branches subdivided or of over 40 μ in length.

(4) Capitate hyphopodia.
- 0.....Absent.
- 1.....Alternate or unilateral.
- 2.....Opposite.
- 3.....Both alternate and opposite.

II. Measurements (numbers on right of period).

(5) Spore length.
- 1.....20 μ long or less.
- 2.....30 μ long or less.
- 3.....40 μ long or less.
- 4.....50 μ long or less.
- 5.....60 μ long or less.
- 6.....over 60 μ long.

(6) Spore breadth.
- 1.....10 μ or less.
- 2.....20 μ or less.
- 3.....30 μ or less.
- 4.....over 30 μ.

(7) Perithecium (diameter).
- 1.....100 μ or less.
- 2.....200 μ or less.
- 3.....300 μ or less.
- 4.....Over 300 μ.

(8) Mycelial setae (length).
- 0.....Absent.
- 1.....300 μ or less.
- 2.....500 μ or less.
- 3.....1,000 μ or less.
- 4.....More than 1,000 μ.

KEY TO GENERA OF *MELIOLINEAE*.

A.—Perithecia typically dimidiate at maturity.....1. *Amazonia*.
B.—Perithecia globose, not dimidiate at maturity.
(*a*) Mycelium devoid of hyphopodia.....2. *Meliolina*.
(*b*) Mycelium with typical capitate hyphopodia.
1. Mycelium devoid of setae.....3. *Irene*.
2. Mycelium with setae.....4. *Meliola*.

AMAZONIA (Theiss.).

Ann. Myc 11, p. 499 (1913).
Syn. *Meliolaster* Doidge (nec van Höhnel), Trans. Roy. Soc. South Africa 8, p. 123 (1920).

Mycelium superficial, with hyphopodia, *Meliola*-like. Outer perithecial wall radial, shield-like, hemispherical, inverse; inner wall pale, thin, completely closed. Asci aparaphysate 2-spored, clavate. Spores 4-septate.

Amazonia asterinoides (Winter) Theiss.

Ann. Myc. 11, p. 499 (1913).
Meliola asterinoides Winter, Hedwigea 25, p. 96 (1886).
Meliolaster Mackenzii Doidge, Trans. Roy. Soc. South Africa 8, p. 123 (1920).

Hypophyllous, colonies minute, round, 1·5-2·5 mm. diameter; mycelium composed of brown hyphae 6-7 μ thick, flexuous or almost straight; branches alternate; cells 15–16 μ long. Capitate hyphopodia alternate or unilateral, very briefly stipitate, curved, 10–15× 6–7 μ; head cell sub-globose or ovoid, convex. Mucronate hyphopodia ampulliform, scattered amongst the capitate hyphopodia, sometimes sub-uncinate at the apex, 12-15× 6-7 μ. Mycelial setae none. Perithecia dimidiate, radiate, 250-350 μ diameter, composed of straight hyphae 4–6 μ thick, with cells about 10 μ long, fimbriate at the margin. Asci aparaphysate, evanescent, ellipsoid, 2-spored, 50–57 × 20–23 μ. Spores cylindrical or subclavate, 4-septate brown, rounded at both ends, slightly constricted, 33-37×10-13·5 μ.

Host: *Piper capensis* L.f., 17.8.18, Buccleuch, Natal, Doidge [11570].

MELIOLINA (Syd.).

Ann. Myc. 12, p. 553 (1914).

Mycelium superficial, brown, reticulate, without hyphopodia, but with setae Perithecia arising from the mycelium, black, leathery or carbonaceous, without a true ostiole, with or without setae. Asci aparaphysate, usually 2 3-spored, thick-walled, ellipsoid. Spores brown, 3 or 4-septate.

Meliolina cladotricha (Lev.) Syd.

Ann. Myc. 12, p. 553 (1914). Stevens Ann. Myc. 25, p. 419 (1927).
Syn. *Meliola cladotricha* Lev., Ann. Sc. Nat. Ser. 3. Bot. 5. p. 266 (1846).

Amphigenous, forming thick, black, velvety spots 2-5 mm. diameter, frequently confluent. Mycelium composed of branched hyphae, 6-8 μ thick, with remote articulations. Mycelial setae opaque at the base, paler at the summit, bifid, each division giving rise to two or three branches with acute apices. There are frequently groups of crystals of calcium oxalate at the tips of the setae. Perithecia black, globose, 300-400 μ diameter, with granular surface. Asci ovoid with a very short foot, 2-spored. Spores 3-septate, constricted, attenuate towards the ends, 65–70×18–22 μ.

Host: *Eugenia Gerrardi* Sim, Woodbush, Northern Transvaal, 3.8.11. Doidge [1759], same locality, 16.9.23 Doidge [17754].

IRENE (Theiss. et Syd.).

Ann. Myc. 15, p. 194 (1917).

Syn. *Irenina* Stevens, Ann. Myc. 25, p. 411 (1927).

Mycelium superficial, brown, reticulate, with hyphopodia, but without setae. Perithecia arising from the mycelium, black, leathery or carbonaceous, smooth or verrucose, without setae and with or without typical larviform appendages, without a true ostiole, parenchymatous. Asci aparaphysate, usually 2–3-spored, thick walled ellipsoid. Spores brown, 3–4-septate.

I. Spores with typical, larviform appendages. (*Appendiculella* van Höhn., Sitzber. K. Akad. Wiss. Wien. Math.-naturw. Kl. 128, p. 556, 1919).

A.—Spores 3-septate, capitate hyphopodia lobed.

1. Spores 50–60 μ long..... 1. *I. speciosa.*
2. Spores 40–50 μ long.
   - (*a*) Spores deeply constricted..... 2. *I. natalensis.*
   - (*b*) Spores slightly constricted.
     - o. Stalk cell of capitate hyphopodia short, straight, cylindrical..... 3. *I. calostroma.*
     - oo. Stalk cell long, often flexuous or curved.... 4. *I. gloriosa.*

II. Perithecia without typical larviform appendages.

A.—Spores 3-septate.

- (*a*) Capitate hyphopodia lobed..... 5. *I. Peddieae.*
- (*b*) Capitate hyphopodia not lobed..... 6. *I. Podocarpi.*

B.—Spores 4-septate.

1. Surface cells of perithecium, prolonged into conical or horn-shaped processes not more than 25–30 μ long (not typical vermiform appendages).
   - (*a*) Capitate hyphopodia, lobed..... 7. *I. Rinoreae.*
   - (*b*) Capitate hyphopodia, not lobed..... 8. *I. inermis.*
2. Surface cells of perithecium mammillate.
   - (*a*) Spores 50–60 μ long..... 9. *I. ditricha.*
   - (*b*) Spores 45–50 μ long.....10. *I. Nuxiae.*
   - (*c*) Spores 30–45 μ long.....11. *I. Peglerae.*
3. Surface cells of perithecium, rounded or broadly conical.
   - (*a*) Capitate hyphopodia, lobed or sub-lobed.
     - x. Spores 50–55 μ long.
       - o. Spores cylindrical, cells equal.....12. *I. atra.*
       - oo. Spores ellipsoid, medial cell larger....13. *I. implicata.*
     - xx. Spores 40–45 μ long.....10. *I. Zeyheri.*
     - xxx. Spores 35–40 μ long.....15. *I. scabra.*
   - (*b*) Capitate hyphopodia, not lobed.
     - x. Head cell of capitate hyphopodia, ovoid or globose.....16. *I. glabra.*
     - xx. Head cell, cylindrical.....17. *I. Strophanthi.*

1. Irene speciosa Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920); Stevens, Ann. Myc. 25 p. 422 (1927).

Syn. *Meliola speciosa* Doidge, Trans. Roy. Soc. South Africa 5, p. 726 (1917).

Group number 2201. 5330.

Hypophyllous, forming round irregular spots, 1–5 mm. diameter. Mycelium radiating, compact; hyphae brown, straight, 7–10 μ thick; cells short, up to 25 μ long, but frequently only 18 μ; branches usually opposite. Capitate hyphopodia crowded, alternate, usually one to each cell, large, showy; stipe cell cylindrical, somewhat attenuate towards the base,

7–11 μ long and 5·5–7 μ broad; head cell broader than long, 20–25 μ broad and 18–22 μ long, irregular in form, 2–4-lobed, each lobe being concave or bi-lobulate. Mucronate hyphopodia very scarce, slender, pale and curved, about 25 × 7 μ. Perithecia grouped in the centre of the colony, black, globose, carbonaceous, 200–260 μ diameter: surface cells conical, certain of them being produced into sub-cylindrical larviform appendages curving upwards, 70–90 μ long, 18–25 μ thick at the base, and tapering somewhat towards the tip. Asci 2-spored, evanescent. Spores ellipsoid, 3-septate, scarcely constricted at the septa, 50–60 × 20–25 μ.

Host: *Gymnosporia* sp. Woodbush, Northern Transvaal, 2.8.11, Doidge [1740]. The material is scanty and parasitised.

2. **Irene natalensis** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920); Stevens, Ann. Myc. 25, p. 422 (1927).

Syn. *Meliola natalensis* Doidge, Trans. Roy. Soc. South Africa 5, p. 724 (1917).

Meliola natalensis, vars. *laxa* Doidge and *conferta* Doidge, Trans. Roy. Soc. South Africa 5, p. 724 (1917).

Meliola conferta Doidge, Trans. Roy. Soc. South Africa 5, p. 724 (1917).

Irene natalensis, vars. *laxa* (Doidge) Stevens and *conferta* (Doidge) Stevens, Ann. Myc. 25, p. 422 (1927).

Group number 2203. 4230.

Amphigenous, mostly epiphyllous, forming round to irregular, black, carbonaceous spots 1–3 mm. diameter, or diffuse and not forming definite spots. Mycelium radiating, varying very much in different collections; sometimes very compact, with regular opposite branches and stiff straight hyphae; sometimes diffuse, irregularly branched, and with more or less sinuous hyphae. Hyphae deep fuscous brown, 6–8 μ thick, cells 11–40 μ long. Capitate hyphopodia alternate (one to each cell, or more distant) or opposite and crowded, stipitate, 14–21 μ high; stipe cell short, attenuate towards the base; head cell broader than long, usually 2–3-lobed, lobes usually concave or bi-lobulate, 9–14 μ long and 11–20 μ broad. Mucronate hyphopodia not numerous (more frequent on the diffuse mycelium), scattered, slender, straight, or with a curved neck, 16–18 × 4–5 μ. Perithecia scattered or grouped near the centre of the mycelium, black, globose, carbonaceous, 180–250 μ diameter; surface cells of the perithecia conical, many of them being produced into sub-cylindrical larviform appendages, which are 40–55 μ long, 18–20 μ broad at the base, and tapering somewhat to the recurved tip. Asci 2-spored. Spores 3-septate, cylindrical or somewhat ellipsoid deeply constricted at the septa, 40–45 × 14–16·5 μ, straight or slightly curved, rounded at both ends.

Hosts: *Doryalis rhamnoides* Harv., near Durban, Natal, 14.5.97, Medley Wood [345]; Umgeni Beach, Durban, 4.6.12, Pole Evans [2412]; Umgeni Beach, 27.5.15, Doidge [8980]; Hilton Road, Natal, 21.7.18, Doidge [11608]; Langholm Estates, Bathurst Dist., Cape Province, 14.7.19, Doidge [12347]; Karkloof, Natal, 14.7.21, Doidge [14950]; The Wilderness, George, 10.5.23, Doidge [17118]; Van Stadens Pass, Cape Province, 19.5.23, Doidge [17256]; East London, 19.7.19, Doidge [12429].

Doryalis rotundifolia Thunb., Kowie, Cape Province, 15.7.19, Doidge [12363], same locality, 9.11.19, Britten [14222].

Scolopia Mundtii Arn., Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11827]; Haenertsburg, 14.9.23, Doidge [17772]; Woodbush, 16.9.23, Doidge [17758].

This is a species of very variable habit, and there is very conceivable intermediate form between the *conferta* type (*e.g.*, 345), with compact mycelium and crowded, opposite hyphopodia, and the *laxa* type (*e.g.*, 11608), with diffuse mycelium and remote, alternate hyphopodia. These extremes can therefore no longer be regarded as distinct varieties.

3. **Irene calostroma** (Desm. v. Höhnel).

Ann. Myc. 16, p. 213 (1918), Stevens, Ann. Myc. 25, p. 432 (1927).

Syn. *Sphaeria calostroma* Desm., Bull. Soc. Bot. France 4, p. 1011 (1857).

Chaetosphaeria calostroma (Desm.) Sacc., Syll. Fung. 2, p. 95 (1883).
Meliola puiggarii Speg., Bull. Acad. Nac. Cient. Cordoba 11, No. 288 (1889).
Meliola autumnalis Syd., Ann. Myc. 2, p. 169 (1904).
Meliola rubicola P. Henn., Hedwigia 43, p. 140 (1904).
Meliola calostroma (Desm.) v. Höhn., Sitzber. K. Akad. Wiss. Wien. Math-natur. Kl. 128, p. 156 (1919).
Appendiculella calostroma (Desm.) v. Höhn., Sitzber. K. Akad. Wiss. Wien. Math-natur. Kl. 128, p. 556 (1919).
Irene puiggarii (Speg.) Doidge, South African Journ. Nat. Hist. 2, p. 39 (1920). See also Trans. Roy. Soc. South Africa 5, pp. 723-724 (1917) and 7, pp. 195–197 (1919).

Group number 2201. 4230.

Amphigenous, mostly epiphyllous, forming black, orbicular or irregular, thinly carbonaceous spots 2–5 mm. diameter, these frequently become confluent and cover the greater part of the leaf surface. Mycelium fuscous, rather pale, radiating, consisting of straight or sinuous hyphae 6·5–8 μ thick, branching irregularly and anastomosing to form a rather open network; branches opposite or unilateral; cells usually 25–30 μ long. Capitate hyphopodia alternate, rather distant, usually one to each cell, stipitate, 20–30 μ long; stipe cell short, cylindrical, or somewhat attenuate towards the base, about the same thickness as the hypha; head cell 16–20 μ broad, truncate, or more frequently with 2–3 shallow lobes; lobes truncate, rounded or more or less concave. Mucronate hyphopodia interspersed with the capitate hyphopodia, fairly numerous, opposite or unilateral, occasionally two being borne close together on the same side of the hypha, slightly paler, ampulliform, 14–24 × 6–8 μ, narrowed suddenly near the apex into a short neck. Perithecia usually in a small group in the centre of the colony, black, globose, carbonaceous, 200–250 μ diameter; surface cells conical to mammillate, round to polygonal at the base and 16–20 μ diameter, certain cells being prolonged into brown, chitinous, sub-cylindrical, larviform appendages, which are 60–110 μ long and 20–26 μ thick at the base, recurved at the apex and tapering to a point. Asci 2–3-spored, evanescent. Spores 3-septate, cylindrical, straight or slightly curved, similar in colour to the hyphae, scarcely constricted at the septa, rounded at both ends, 40–45 × 13–14 μ.

Hosts: *Cliffortia ferruginea*, L. fil., Van Stadens Pass, Cape Province, 13.11.17., Doidge [10861].

Cliffortia strobilifera Murr., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10859]; Pole Evans, 17.5.18 [11442].

Leucosidea sericea Eck. and Zey., Nottingham Road, Natal, 8.4.17, van der Bijl [11357] Tugela Valley, near Mont aux Sources, 14.5.20, Doidge [14130].

Pygeum africanum Hook. fil., Woodbush, Northern Transvaal, 3.8.11, Doidge [1761].

Rubus pinnatus Willd., Woodbush, 5.8.11, Doidge [1771]; Knysna, 3.6.12, Pienaar [2425]; Buccleuch, Natal, 20.4.16, Sim [10150]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12278]; Storms River, Humansdorp District, 15.5.23, Doidge [17185].

Rubus rigidus Sm., Inanda, Natal, June 1881, Medley Wood [9503]; Winters Kloof, Natal, 26.6.11, Doidge [1574]; Woodbush, 18.9.23, Doidge [17735].

4. **Irene gloriosa** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920); Stevens, Ann. Myc. 25, p. 422 (1927).
Syn. *Meliola gloriosa* Doidge, Trans. Roy. Soc. South Africa 8, p. 139 (1920).

Group number 2201. 4240.

Hypophyllous, rusty brown, forming round colonies, 5–10 mm. diameter, which frequently show fairly distinct, concentric zoning. Mycelium radiating, arachnoid, consisting of slender fuscous hyphae 4·6–5 μ thick, which are tortuous, densely interwoven, and with cells 30–50 μ long; branching irregular. Capitate hyphopodia alternate or unilateral, remote (many cells not producing hyphopodia), slender, stipitate, 30–80 μ long; stipe cells 14–64 μ long, cylindrical, as thick as the hyphae, or somewhat attenuate towards the

base, sometimes prolonged and 1-septate and variously bent and curved ; head cell about 16 μ long and 13–20 μ broad, very diverse in form, often sub-lobed and not infrequently inversely triangular. Mucronate hyphopodia sparse, paler than the hyphae, slender, lageniform, often gibbose, 18–20 × 5–6 μ. Perithecia numerous, flattened-globose, black, carbonaceous, 300–350 μ diameter, with very numerous ascending larviform appendages, 65–80 μ long and 25–30 μ thick at the base, tapering to the apex which is often recurved. Asci evanescent. Spores 3-septate, ellipsoid, scarcely constricted or slightly so, straight or somewhat curved, rounded at both ends, 45–50 × 15–18 μ.

Host : *Celastrus ?cordatus*, Buccleuch, Natal, 17.7.18, Doidge [11565].

5. **Irene Peddieae** Doidge.

Bothalia 2, p. 235 (1927).

Group number 2101. 4230.

Amphigenous, mostly epiphyllous, forming dark, round to irregular blotches up to 10 mm. diameter. Mycelium brown, forming a rather dense network : hyphae 6–7 μ thick, sinuous, with opposite branches ; cells about 30–35 μ long ; capitate hyphopodia alternate, not crowded, usually one to each cell, 24–30 μ high, stalk cell cylindrical or becoming slightly thicker from the base upwards, head cell irregularly 2–4-lobed ; lobes rounded, flattened or bi-lobulate, 15–20 μ broad. Mucronate hyphopodia not very numerous, opposite, alternate or unilateral, lageniform, straight, curved or gibbose, 17–20 μ high, 6–7 μ thick. Perithecia scattered, spherical, 200–240 μ diameter, without appendages, collapsing at maturity, formed of cells about 10 μ diameter. Spores brown, 3-septate, straight or slightly curved, oblong, rounded at both ends, somewhat constricted at the septa, 40–44 × 15–16·5 μ.

Host : *Peddica africana*, Harv., Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11840] ; Woodbush, Northern Transvaal, 16.9.23, Doidge [17777].

6. **Irene Podocarpi** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920).

Syn. *Meliola Podocarpi* Doidge, Trans. Roy. Soc. South Africa 5, p. 725 (1917).

Irene anisomera Syd., Ann. Myc. 15, p. 194 (1917).

Irenina Podocarpi (Doidge), Stevens, Ann. Myc. 25, p. 447 (1927).

Group number 2101. 5230.

Amphigenous but mostly epiphyllous, forming thin, black colonies 2–5 mm. diameter, frequently confluent. Mycelium dark brown, branching very regularly and anastomosing to form a rather open network. Hyphae mostly straight, but at times somewhat sinuous, 6–7 μ thick ; composed of cells 16–20 μ long ; branches opposite. Capitate hyphopodia alternate, usually one to each cell, very briefly stipitate, 14–16 μ long ; head cell globose or broadly ovate 16–12 × 10–11 μ. Mucronate hyphopodia not seen. Perithecia, scattered or in small groups, with numerous slender hyphae radiating from the base, black, globose, carbonaceous, 200–250 μ diameter ; cells of perithecial wall conical. Asci 2–4-spored. Spores 3-septate, brown, constricted at the septa, tapering somewhat to the rounded ends and usually slightly curved, 50–56 × 14–16 μ ; the two central cells being larger than the terminal ones, and when the spore is immature, darker in colour.

Hosts : *Podocarpus elongata* L' Herit., Woodbush, Northern Transvaal, 4.8.11, Doidge [1822] ; Fort Cunninghame, Cape Province, March 1915 [8897] ; Buccleuch, Natal, 17.7.18, Doidge [11561] ; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12322] ; Karkloof, Natal, 14.7.21, Doidge [14967] ; Storms River, Humansdorp District, 15.5.23, Doidge [17166] ; Deepwalls, Knysna, 13.5.23, Doidge [17217].

Podocarpus falcata R. Br., Buccleuch, Natal, 17.7.18, Doidge [11552].

Podocarpus Thunbergii Hook, Woodbush, March 1910, Gray [889] ; Woodbush, 3.8.11, Doidge [1748] ; Tabankulu, Pondoland, 15.3.15, Fraser [8889] ; Tabankulu, 4.4.15 [9102] ; Duncairn, Natal, 13.7.21, Doidge [14960 and 14968].

7. **Irene Rinoreae** Doidge.

Bothalia 1, p. 80 (1922).

Syn. *Irenina Rinoreae* (Doidge) Stevens, Ann. Myc. 25, p. 468 (1927).

Group number 3101. 4320.

Amphigenous, forming small, round, dull-black colonies 1–4 mm. in diameter, usually scattered but occasionally numerous and confluent. Mycelium brown, reticulate; hyphae straight, 6–7 μ thick; cells mostly 18–20 μ long; branches opposite or unilateral, anastomosing. Capitate hyphopodia alternate, usually one to each cell, stipitate, 17–26 μ high; stipe cell short, cylindrical; head cell 17–20 μ broad, variously lobed; lobes rounded or truncate. Mucronate hyphopodia rather numerous, paler, opposite or alternate, interspersed with the capitate hyphopodia, lageniform or almost cylindrical with rather thick, curved necks, 17–20 μ long and 5–6 μ thick at the base. Perithecia black, globose, carbonaceous, 140–200 μ diameter, surface cells conical or rounded, some projecting to a height of 16–18 μ. Asci fugaceous, not seen. Spores 4-septate, cylindrical, rounded at both ends constricted at the septa, 40–46 × 16·5–21·5 μ.

Host: *Rinorea ardesiaeflora* Welw., Winters Kloof, Natal, 13.9.19, Doidge [12445]; Karkloof, Natal, 14.7.21, Doidge [14961 and 14969].

The material is very scanty; the fungus occurs sparsely on the leaves, and only a few colonies can be found even by careful searching.

8. **Irene inermis** (Kalch. et Cke.) Theiss. et Syd.

Ann. Myc. 15, p. 194 (1917); Stevens, Ann. Myc. 25, p. 429 (1927).

Syn. *Meliola quinqueseptata* Rehm., Ascomycetes p. 492.

Meliola inermis Kalch. et Cke., Grev. 9, p. 34 (1880); Trans. Roy. Soc. South Africa 5, p. 730 (1917).

Meliola acervata Ell. et Ev., Bull. Torrey Bot. Club 24, p. 126 (1897).

Group number 3101. 4230.

Amphigenous, but mostly epiphyllous, forming small, black, thinly carbonaceous colonies 1–3 mm. in diameter, sometimes very numerous and becoming confluent. Mycelium brown, radiating; hyphae 6·5–9 μ thick, sinuous, composed of cells 18–24 μ long, branches usually opposite and at an acute angle with the hyphae. Capitate hyphopodia alternate, usually one to each cell, stipitate, 16–30 μ long; stipe cell cylindrical, about the same thickness as the hypha; head cell ovate or globose, rarely truncate, 13–17 μ long and 10–13 μ broad. Mucronate hyphopodia not very numerous, usually on separate short branches near the centre of the colony, opposite, ampulliform, with a short neck, 14–18 μ long. Perithecia scattered, black, globose, carbonaceous, 200–270 μ diameter; surface cells irregularly rounded or conical, rarely mammillate, often produced into irregularly conical or horn-shaped processes up to 25 μ long, 14–18 μ diameter at the base. Asci 2-spored, evanescent. Spores 4-septate, ellipsoid, constricted at the septa, rounded at both ends, 35–45 × 13–15 μ.

Hosts: *Buddleia auriculata* Benth., Nottingham Road, Natal, 8.4.17, van der Bijl [11359]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12327]; Langholm Estates, Bathurst Dist., 14.7.19, Doidge [12354]; Woodbush, Northern Transvaal, 18.9.23, Doidge [17764].

Buddleia pulchella N.E. Br., Amanzimtoti, Natal, 10.7.11, Doidge [1571]; Buccleuch, Natal, 17.7.18, Doidge [11568]; Zwartkop, near Pietermaritzburg, Natal, 17.7.18, Doidge [11602].

Buddleia salvifolia Lam., Woodbush, Northern Transvaal, 2.8.11, Doidge [1742]; Buccleuch, Natal, 20.4.16, Sim [10146]; Nottingham Road, Natal, 5.4.17, van der Bijl [11356]; Mont aux Sources, Natal, 20.5.20, Doidge [14127]; Deep Walls, Knysna, 13.5.23, Doidge [17211]; Long Ridge, Knysna Dist., 14.5.23, Doidge [17229]; Woodbush, Northern Transvaal, 16.9.23, Doidge [17765].

Chilianthus dyssophyllus Benth., Buccleuch, Natal, 17.7.18, Doidge [11583].

9. **Irene ditricha** (Kalch. et Cke.) Doidge.

South African Journ. Nat. Hist. 2, p. 41 (1920).

Syn. *Asterina ditricha* Kalch. et Cke., Grevillea 9, p. 32 (1880).

Meliola ditricha (Kalch. et Cke.) Doidge, Trans. Roy. Soc. South Africa 5, p. 728 (1917), 8, p. 138 (1920).

Irenina ditricha (Doidge) Stevens, Ann. Myc. 25, p. 467 (1927).

Group number 3101. 5340.

Amphigenous, forming crustaceous, dense black colonies 2–3 mm., rarely up to 5 mm. in diameter. Mycelium dark brown, radiating, dense, branching freely, compact, terminal branches and hyphopodia often closely crowded, 7–10 μ thick, often rugose and uneven in thickness, consisting of cells 18–21 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, clavate, stipitate, 25–35 μ long; stipe cell short, cylindrical or attenuate towards the base; head cell irregular in shape, variously lobed, 18–25 μ long and 14–22 μ broad. Mucronate hyphopodia fairly numerous, on separate short branches or interspersed with the capitate hyphopodia, opposite or unilateral, slender lageniform with rather a thick neck, 21–25 × 7–8 μ. Perithecia grouped in the centre of the mycelium, spherical, black, opaque, 280–320 μ diameter; wall consisting of large cells of varying size, which are produced into opaque black conical or mammillate papillae, 30–40 μ long and 25–35 μ broad at the base. Asci 2-spored or more rarely 3-spored, evanescent. Spores 4-septate, very dark brown, cylindrical or ellipsoid, slightly constricted at the septa, rounded at both ends, 50–57 × 20–25 μ.

Hosts: *Celastrus spp.*, Inanda, Natal, May 1876, Medley Wood (Wood 3) [11518]; Buccleuch, Natal, 17.7.18, Doidge [11579].

Pleurostylia capensis Oliv., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10883].

10. **Irene Nuxiae** Syd. n. sp.

Sub. *Meliola Heudeloti* Gaill., Trans. Roy. Soc. South Africa 5 (1917).

Irene Heudeloti (Gaill.) Doidge, South African Journ. Nat. Hist. 2, p. 40 (1920).

Irenina Heudeloti (Gaill.) Stevens, Ann. Myc. 25, p. 459 (1927).

Group number 3101. 4330.

Amphigenous, but mostly epiphyllous, forming thin, black, orbicular, crustaceous spots 2–4 mm. diameter. Mycelium not very dense, composed of rather light brown hyphae, which are straight or somewhat sinuous, slightly constricted at the septa, 5–8 μ thick; cells 15–30 μ long; branches opposite, making an acute angle with the main hyphae. Capitate hyphopodia fairly numerous, usually one to each cell, alternate or unilateral, stipitate, 16–20 μ long; stalk cell short, cylindrical or tapering somewhat towards the base; head cell globose ovoid, broadly rounded or truncate above, 11–16 × 9–11 μ. Mucronate hyphopodia fairly numerous, developing chiefly in the centre of the colony, opposite, usually on separate short branches, rarely interspersed with the capitate hyphopodia, 15–18 μ long, lageniform. Perithecia fairly numerous, scattered, black, globose, carbonaceous, 180–220 μ diameter; surface cells irregular, 15–30 μ diameter, grossly mammillate, with their apices curved or bent laterally. Asci 2-spored, ovate, very briefly pedicellate. Spores 4-septate, brown, cylindrical-compressed, broadly rounded at both ends, slightly constricted, 45–50 × 18–22 μ.

Hosts: *Nuxia floribunda* Benth., Woodbush, Northern Transvaal, 3.8.11, Doidge [1776]; Van Stadens Pass, Cape Province, 9.3.16, Bottomley [9554], same locality 13.11.17, Doidge [10874]; Woodville Forest, George, 11.11.17, Doidge [10942]; Van Stadens Pass, 17.5.18, Pole Evans [11441]; Louis Trichardt, Transvaal, 8.4.19, Putterill [11837]; Buccleuch, Natal, 17.7.18, Doidge [11571]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12284]; Karkloof, Natal, 14.7.21, Doidge [14944]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17181]; Keurkloof Forest, George, 9.5.23, Doidge [17107]; Deepwalls, Knysna, 13.5.23, Doidge [17212]; Van Stadens Pass, 19.5.23, Doidge [17261]; Woodbush, 16.9.23, Doidge [17745].

Nuxia tomentosa Sond., Woodbush, 3.8.11 and 16.9.23, Doidge [1746 and 17743].

This species is extremely common on *Nuxia floribunda* in all the forest areas.

11. **Irene Peglerae** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1929); Stevens, Ann. Myc. 25, p. 427 (1927).

Syn. *Meliola Peglerae* Doidge, Trans. Roy. Soc. South Africa 5, p. 730 (1917).

Group number 3201. 3220.

Epiphyllous, forming sub-crustaceous, black, orbicular colonies, 1–3 mm. diameter, or covering larger areas by confluence. Hyphae brown, straight, 7–9 μ thick, very frequently septate; cells 8–14 μ long; branches opposite, forming an acute angle with the main hyphae. Capitate hyphopodia alternate, very numerous, usually one to each cell, appressed towards the hyphae, 20–25 μ long; stipe cell short, 4–7 μ long; head cell obovoid to cylindrical, straight or recurved, 14–18 × 7–11 μ. Mucronate hyphopodia few in number, opposite, ampulliform, 14–22 × 7 μ. Perithecia crowded together in the centre of the colony, black, globose, carbonaceous, 125–235 μ diameter; surface cells mammillate. Asci 2–4-spored, evanescent. Spores 4-septate, brown, oblong, rounded at both ends, slightly constricted, 29–43 × 16–18 μ.

Hosts: *Anastrabe integerrima* E. Mey., Kentani, Cape Province, 4.6.12, Pegler [2363]; Umgeni, Natal, 16.7.15, Medley Wood [9036].

Bowkeria triphylla Harv., Buccleuch, Natal, 17.7.18, Doidge [11572].

Halleria elliptica L., Woodville Forest, George, 11.11.17, Doidge [10932].

Halleria lucida L., Keurkloof Forest, George, 9.5.23, Doidge [17116]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17182]; Deep Walls, Knysna, 13.5.23, Doidge [17200].

12. **Irene atra** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920).

Syn. *Meliola atra* Doidge, Trans. Roy. Soc. of South Africa 8, p. 137 (1920).

Irenina atra (Doidge) Stevens, Ann. Myc. 25, p. 466 (1927).

Group number 3101. 5320.

Amphigenous, mostly epiphyllous: colonies black, crustaceous, compact, round to irregular, up to 3 mm. diameter; leaf tissues discoloured under the mycelium. Mycelium dark brown, radiating and copiously branched; hyphae almost straight, 8–10 μ thick, composed of short cells 12–16 μ long, often slightly constricted at the septa; branches usually opposite, widely divergent, often almost at right angles to the main hypha. Capitate hyphopodia numerous, alternate or unilateral, usually one to each cell of the hypha, briefly stipitate, 20–27 × 16–20 μ; stipe cell short, cylindrical, not broader than the hyphae; head cell broad, irregularly 2–4 (usually 3) lobed; lobes truncate and rounded or bi-tri-lobulate. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, opposite or unilateral, pyriform or lageniform, not paler than the hyphae, 10–13 × 6–7 μ. Perithecia scattered, black, carbonaceous, 150–200 μ diameter (immature); asci not seen. Spores broadly ellipsoid, 4-septate, very slightly constricted, rounded at both ends, 50–54 × 20–25 μ.

Host: *Eugenia sp.*, Zwartkop, near Pietermaritzburg, Natal, 19.7.18 and 6.9.19, Doidge [11594 and 12436].

The fungus is rather scanty, although copious material of the host was collected; and 11594 is heavily parasitised.

13. **Irene implicata** Doidge.

Bothalia 1, p. 206 (1924).

Syn. *Irenina implicata* (Doidge) Stevens, Ann. Myc. 25, p. 465 (1927).

Group number 3103. 5330.

Mycelium hypophyllous, forming rather indefinite, round, grey-black spots, 2–4 mm. diameter. Hyphae pale fuscous, rather thin-walled, sub-torulose, 5–6·6 μ thick, branching irregularly, anastomosing and forming a tangled network amongst the lepidote scales on the under side of the leaf; cells variable in length. Capitate hyphopodia usually alternate or unilateral, sometimes opposite, stipitate, 20–40 × 10–20 μ; stipe cell usually cylindrical

or attenuate towards the base, 3·5–16 μ in length; head cell very variable in form and dimensions, club-shaped, truncate or variously and fantastically lobed. Mucronate hyphopodia solitary, opposite or in whorls of three, slender, lageniform, straight or curved, 16–27 × 5–6·5 μ. Perithecia crowded together in the centre of the mycelium, globose, somewhat flattened, verrucose, carbonaceous, 240–290 μ diameter, collapsing at maturity; outer wall composed of rounded or conical cells which are irregularly polygonal at the base and about 10 μ in diameter. Asci 2-spored, evanescent. Spores brown, 4-septate, ellipsoid, constricted at the septa, straight or slightly curved, tapering somewhat towards the rounded ends, 50–54 μ long; medial cell longer than the others and 20–23·5 μ broad; terminal cells not more than 13–14 μ broad.

Host: *Chilianthus arboreus*, A.D.C., Van Stadens Pass, Cape Province, 19.5.23, Doidge [17251]; Deepwalls, Knysna, 23.2.25, Phillips [20345].

14. **Irene Zeyheri** Doidge.

Bothalia 1, p. 75 (1922).

Syn. *Irenina Zeyheri* (Doidge) Stevens, Ann. Myc. 25, p. 467 (1927).

Group number 3101. 4230.

Amphigenous, forming thin black spots 2–4 mm. diameter, or becoming confluent and covering larger areas. Mycelium not dense, forming an irregular network; hyphae straight or somewhat sinuous, 6–6·5 μ thick, cells 20–30 μ long, branches opposite or irregular, anastomosing. Capitate hyphopodia alternate, usually one to each cell, 18–23 μ long; stipe cell cylindrical; head cell variable in form, ovate, sub-lobed or irregularly lobed, 6–14 μ broad at the apex. Mucronate hyphopodia opposite or unilateral, interspersed with the capitate hyphopodia, ampulliform 16–20 × 6–7 μ. Perithecia scattered, black, globose, carbonaceous, 180–240 μ diameter, surface cells rounded or conical. Asci 2-spored, evanescent. Spores oblong, brown 4-septate, slightly constricted, rounded at both ends, 39–44 × 16–18 μ.

Host: *Eugenia Zeyheri* Harv., Kentani, Cape Province, 3.6.15, Pegler [9126]; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10878]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12272]; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12388]; Fern Kloof, Grahamstown, 8.12.18, Britten [14211]; Van Stadens Pass, 19.5.23, Doidge [17264].

15. **Irene scabra** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920).

Syn. *Meliola scabra*, Doidge, Trans. Roy. Soc. South Africa 7, p. 194 (1919).

Irenina scabra (Doidge) Stevens, Ann. Myc. 25, p. 464 (1927).

Group number 3101. 3230.

Amphigenous, forming thin black colonies 5–10 μ diameter. Hyphae straight or somewhat flexuous, 6–7 μ thick, with opposite branches and cells 24–30 μ long. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 23–38 μ long; stipe cell 6–14 μ long, cylindrical; head cell ovate or bent, often irregularly sub-lobed. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or unilateral, lageniform, neck sometimes curved. Perithecia black, carbonaceous, globose, 200–250 μ diameter; surface cells rounded or conical. Asci 2-spored. Spores 4-septate, cylindrical, broadly rounded at both ends, scarcely constricted at the septa, 36–40 × 14–17 μ.

Hosts: *Trichocladus crinitus* Pers., Woodville Forest, George, 11.11.17, Doidge [10939]; Izelini Forest, Kingwilliamstown, 22.6.18, [11611]; Deepwalls, Knysna, 7.3.25, Phillips [20382].

Trichocladus ellipticus Eckl. and Zey., Tabankulu, Transkei, 15.3.14, Fraser [8891]; Branders High Forest, Victoria East, 14.8.15, Van der Bijl [9462]; Hogg's Back, Cape Province, 15.1.18, Henderson [11338]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12298].

The material is poor and badly parasitised.

16. **Irene glabra** (Berk. & Curt.) Doidge.

South African Journ. Nat. Hist. 2, p. 41 (1920).

Syn. *Meliola glabra* Berk. et Curt., Journ. Linn. Soc. Lond. 20, p. 392 (1869).

Irene glabra (Berk. and Curt.) Toro, Mycol. 17, p. 239 (1925).

Irenina glabra (Berk. and Curt.) Stevens, Ann. Myc. 25, p. 461 (1927).

Group number 3101. 4230.

Amphigenous, but most frequently epiphyllous, forming black crustaceous spots 2–3 mm. diameter. Hyphae light brown, straight, 7–9 μ thick, rather frequently septate (cells 25–30 μ long), constricted at the septa; branches opposite, emerging at an acute angle with the hyphae. Capitate hyphopodia fairly numerous, usually one to each cell, alternate or unilateral, 18–25 μ long; stipe cell short; head cell ovoid, globose or sub-lobed, 11–14·5 × 11 μ. Mucronate hyphopodia not very numerous, ampulliform, about 14 μ long, neck short and thick. Perithecia grouped to the number of 8 to 10 in the centre of the colony black, globose, carbonaceous 150–180 μ diameter; superficial cells mostly rounded or broadly conical, but forming occasionally conical protuberances rounded at the top. Asci ovoid-oblong, 2–4-spored. Spores brown, 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, 40–45 × 16–18 μ.

Hosts: *Canthium* sp., Woodbush, Northern Transvaal, 3.8.11, Doidge [1780].

Pavetta sp., Woodbush, 4.8.11, Doidge [1834].

Kraussia lanceolata Sond., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10871].

Rubiaceae undet., Langholm Estates, Bathurst District, 14.7.19, Doidge [12367].

17. **Irene Strophanthi** Doidge.

South African Journ. Nat. Hist. 2, p. 41 (1920).

Syn. *Meliola strophanthi* Doidge, Trans. Roy. Soc. South Africa 5, p. 729 (1917).

Irenina strophanthi Stevens, Ann. Myc. 25, p. 460 (1927).

Group number 3101. 4230.

Amphigenous, mostly hypophyllous, forming minute, black, round to irregular, sub-crustaceous colonies 1–3 mm. diameter. Mycelium radiating, hyphae brown, straight or somewhat sinuous, 6–9 μ thick, composed of cells 18–27 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 20–25 μ long; head cell cylindrical, straight or slightly curved, rounded at the apex, 16–18 μ long and 7–9 μ thick. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, opposite or unilateral, ampulliform with a short neck, 12–20 μ long. Perithecia scattered, black, globose, carbonaceous 180–240 μ diameter; surface cells rounded or broadly conical. Spores 4-septate, cylindrical, very slightly constricted at the septa, broadly rounded at both ends, 40–45 × 16–18 μ.

Host: *Strophanthus* speciosa Reber, Woodbush, Northern Transvaal, 3.8.11, Doidge [1781]; Buccleuch, Natal, 24.3.16, Doidge [9702]; Woodbush, 10.9.23, Doidge [17717].

MELIOLA (Fries.).

Systema orb. veg. p. 111 (1825), Emend. Bornet. Ann. Sci. Nat. Bot. Ser. 3. 16, p. 257 (1851).

Syn. *Myxothecium* Kze. Weigelt exs. sine no. (1827).

Mycelium superficial, brown, reticulate, with hyphopodia and with setae except in some species with setose perithecia. Perithecia with or without setae, but with no larviform appendages, arising from the mycelium, black, leathery or carbonaceous, without a true ostiole. Asci aparaphysate usually 2–3-spored, thick-walled, ellipsoid. Spores brown 3–4-septate.

KEY TO THE SECTIONS OF *MELIOLA*.

A.—Spores 3-septate.....Section A, Species 1–5.
B.—Spores 4-septate.
(*a*) Perithecia setose—
1. Mycelium not setose.....Section B, Species 6–8.
2. Mycelium setose.....Section C, Species 9.
(*b*) Perithecia not setose—
1. Mycelial setae dentate or branched.....Section D, Species 10–19.
2. Mycelial setae curved, falcate or uncinate.....Section E, Species 20–24.
3. Mycelial setae simple, straight.....Section F, Species 25–54.

SECTION A.

SPORES 3-SEPTATE, PERITHECIAL SETAE NONE, MYCELIAL SETAE PRESENT.

A.—Mycelium forming a compact disc.....1. *M. peltata.*
B.—Mycelium more or less filamentous.
(*a*) Mycelial setae acute at the apex.....2. *M. Scolopiae.*
(*b*) Mycelial setae obtuse at the apex.
1. Setae falcate.....3. *M. campylotricha.*
2. Setae straight or sub-flexuous.
x. Setae 450–600 μ long.....4. *M. Evansii.*
xx. Setae 200–360 μ long.....5. *M. ganglifera.*

1. **Meliola peltata** Doidge.

Trans. Roy. Soc. South Africa 5, p. 727 (1917): Stevens, Ann. Myc. 26, p. 167 (1928).

Group number 2111. 6343.

Amphigenous, forming orbicular, dull black or pilose spots, 1–7 mm. diameter. Mycelium compact, forming a pseudo-parenchymatous disc with a definite margin; hyphae 6–11 μ thick, cells 3–15 μ long; branching flabelliform, the branches being closely appressed to the main hypha. Capitate hyphopodia alternate, fairly numerous, closely appressed to the hyphae, stipitate, sub-clavate, 35–45 μ long; head cell irregular in shape through pressure of surrounding hyphae, usually sub-lobed, 20–30 × 13–20 μ. Mucronate hyphopodia not seen. Mycelial setae few or numerous, straight, simple, quite opaque at the base, less so at the blunt apex, 450–750 μ long, tapering gradually from base to apex. Perithecia rare, black, globose, verrucose, 300–360 μ diameter; cells of perithecial wall convex. Asci not seen. Spores 3-septate, very rarely 2-septate, brown, ellipsoid deeply constricted, 55–70 × 23–27 μ, the majority being 57–60 μ long, the terminal cells being smaller than the medial ones.

HOSTS: *Podocarpus Thunbergii* Hook., Knysna Forest, Cape Province, 3.6.12, Pienaar [2436]; Woodville Forest, George, 11.11.17, Doidge [10934].

Podocarpus falcata R. Br., Buccleuch, near Cramond, Natal, 17.7.18, Doidge [11551].

Podocarpus elongata L'Herit., Deepwalls, Knysna, 13.5.23, Doidge [17218].

This species is rare compared with *Irene Podocarpi*, with which it is associated on the same leaves. Perithecia are scarce, and seem to collapse very readily at maturity; only a few have been seen. The perithecia previously described (loc. cit.) were those of a parasite, and are much more frequent than the Meliola perithecia. Spores in all stages of germination are common in the material collected. The systematic position of this fungus is more than a little doubtful, but a more critical study must be deferred until better material is available.

2. **Meliola Scolopiae** Doidge n. sp.

Group number 2111. 5232.

Amphigenous, forming round, velvety black spots up to 5 mm. diameter; often these are numerous and become confluent, thus forming larger irregular blotches. Mycelium

reticulate, composed of straight or somewhat sinuous hyphae, 6–7 μ thick; cells 20–40 μ long; branches opposite or alternate, emerging at an angle of about 45 degrees with the main hypha. Capitate hyphopodia alternate or unilateral, usually one to each cell, 23–37 μ high, straight or sub-uncinate; stipe cell 6–13 μ long; head cell 10–18 μ broad, irregular in form, usually more or less club-shaped and sub-lobed, or with 2–5 irregular, rounded or truncate lobes. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, opposite or unilateral, slender, lageniform with a curved neck, 20–24 $\times$ 6–6·5 μ. Mycelial setae numerous, simple, straight or slightly curved, erect, opaque right up to tip, 300–400 μ long, 7–10 μ thick at the base, and tapering somewhat towards the acute apex. Perithecia in small groups, black, globose, carbonaceous, 200–300 μ diameter; surface cells convex or mammillate. Asci 2–4-spored, evanescent. Spores dark brown, 3-septate, ellipsoid, rounded at both ends, constricted, 53–57 $\times$ 16·5–20 μ.

Host: *Scolopia Zeyheri* Warb., Table Mountain, near Pietermaritzburg, Natal, 12.7.21, Doidge [14959]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12277]; Mossel Bay, 22.7.15, Pole Evans [9067]; Pirie Forest, 18.7.27, Doidge [22421].

Differs from *M. Evansii* chiefly in the form of the setae, which are shorter, stouter, and have an acute apex.

3. **Meliola campylotricha** Syd.

Ann. Myc. 22, p. 420 (1924); Stevens, Ann. Myc. 26, p. 167 (1928).

Group number 2111. 5232.

Epiphyllous, forming round spots, which are 2–4 mm. diameter, very black, velvety, and usually not confluent. Mycelium composed of chestnut brown hyphae, 7–9 μ thick, closely interwoven, septate, not torulose or slightly so; cells 25–30 μ long; branches emerging at right angles with the hypha. Capitate hyphopodia fairly numerous, 24–28 μ long; stalk cell rather long; head cell 14–18 μ broad, variously lobed. Mucronate hyphopodia not seen. Mycelial setae very numerous, simple, usually more or less curved or falcate, 250–320 μ long, 8–12 μ thick at the base or in the centre, not tapering towards the obtuse apex or slightly so, opaque right to the apex, septate, black, often uneven in thickness or very slightly inflated. Perithecia fairly numerous, globose, rough, 250–300 μ diameter. Asci 2-spored. Spores oblong-cylindrical, 3-septate, usually slightly constricted, straight or unequal-sided, brown, 52–60 $\times$ 18–20 μ; medial cell usually larger.

Host: *Apodytes dimidiata* E. Mey., Woodbush, Transvaal, July 1924, P. A. van der Bijl (van der Bijl 1515).

Not represented in the National Herbarium.

4. **Meliola Evansii** Doidge.

Trans. Roy. Soc. South Africa 8, p. 112 (1920); Stevens, Ann. Myc. 26, p. 168 (1928).

Group number 2111. 5333.

Amphigenous and caulicolous; forming on the twigs irregular, elongated blotches; on the upper leaf surface forming sub-circular, black, carbonaceous spots up to 5 mm. diameter; on the under surface at first round, then becoming more irregular and often spreading along the margin of the leaf. Mycelium reticulate, composed of straight or slightly undulate hyphae, 6–7 μ thick; cells mostly 20–27 μ long; branches alternate, usually emerging at an angle of about 45 degrees with the main hypha. Capitate hyphopodia alternate, usually one to each cell, 24–40 μ high; stipe cell comparatively short, 6–9 μ long, tapering towards the base, occasionally gibbous; head cell 10–17 μ broad, frequently sub-uncinate, more rarely quite straight, irregularly 2–5-lobed; lobes rounded or truncate. Mucronate hyphopodia rare, interspersed with the capitate hyphopodia, narrow-conical, about 16–17 $\times$ 6–6·5 μ. Mycelial setae variable in number, often very numerous, scattered, black, opaque except near the apex, 450–600 μ long, 6–8 μ thick at the base, and tapering gradually to a blunt apex. Perithecia not very

numerous, scattered, black, carbonaceous, globose, verrucose, 200–275 μ diameter, surface cells convex. Asci 2–4-spored, evanescent. Spores 3-septate, brown, ellipsoid, straight or slightly curved, rounded at both ends, slightly constricted, 47–57 × 18·5–23·5 μ,

Hosts: *Cassine eucleaeforme* Kuntze, Woodbush, Northern Transvaal, February 1914 O'Connor (Govt. Herb. [10222]).

Gymnosporia albata L., Kentani, Cape Province, 7.10.14, Pegler [8392 and 8393].

Pterocelastrus tricuspidatus Sond., Quedeni Forest, Zululand, Davis [11237]; Deepwalls, Knysna, 13.5.23, Doidge [17206]; Knysna, 23.2.25, Phillips [20346].

5. **Meliola ganglifera** Kalch.

Trans. Roy. Soc. South Africa 5, p. 727, Pl. 61, Fig. 17; Stevens, Ann. Myc. 26, p. 168 (1928).

Group number 2111. 4232.

Amphigenous, forming round, velvety black spots up to 18 mm. diameter, often confluent and covering much of the leaf surface. Mycelium freely branched and interwoven; branches usually opposite, forming a broad angle with the main hypha; hyphae straight or somewhat sinuous, 6–7 μ thick; cells 20–40 μ long. Capitate hyphopodia alternate, usually one to each cell, stipitate, straight, hooked or uncinate, 27–36 μ long; stipe cell cylindrical or more rarely sub-lobed, up to 10 μ long; head cell up to 20 μ broad, irregularly 3–5-lobed; lobes rounded, truncate or retuse. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, opposite or alternate, ampulliform, 18–21 × 7–9 μ, neck straight, curved or oblique. Mycelial setae numerous, black, opaque except near the apex, simple, straight, abruptly bent almost at right angles just above the base, or more or less flexuous, 200–360 μ long, about 8 μ thick near the base, and tapering gradually to the blunt apex. Perithecia fairly numerous, black, globose, verrucose, 150–250 μ diameter; cells of perithecial wall convex. Asci ovoid, briefly pedicellate, 2–4-spored. Spores cylindrical, 3-septate, rounded at both ends, slightly constricted, 45–50 × 15–18 μ.

Host: *Curtisia faginea* Ait., Woodbush, Northern Transvaal, Burtt Davy [134]; Izelini Forest, Kingwilliamstown, 14.6.15, Emmett [9063]; Kentani, Cape Province, 10.12.15, Pegler [9160]; Hogsback, Victoria East, Cape Province, 12.8.15, van der Bijl [9457]; Woodville Forest, George, February 1918, Sim [11852]; Zwartkop, Natal, 19.7.18, Doidge [11601]; Izelini Forest, Kingwilliamstown, 22.6.18, Doidge [11609]; Woodville Forest, George, 11.11.17, Doidge [10933]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12292]; Howiesons Poort, Grahamstown, 12.7.29, Doidge [12380]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17180]; Deep Walls, Knysna, 13.5.23, Doidge [17213].

SECTION B.

Perithecial Setae Present, no Mycelial Setae.

(*Irenopsis* Stevens, Ann. Myc. XXV, p. 411 1927.)

(*a*) Perithecial setae septate.....6. *M. Bosciae.*

(*b*) Perithecial setae non-septate.

1. Setae uncinate at the tips.....7. *M. clavicudata.*
2. Setae incurved, but not uncinate.....8. *M. comata.*

6. **Meliola Bosciae** Doidge.

Trans. Roy. Soc. South Africa 5, p. 731 (1917), Pl. 61, Fig. 26.

Syn. *Meliola kentaniensis* Doidge, Trans. Roy. Soc. South Africa 8, p. 113 (1920), Pl. 5, Fig. 4.

Irenopsis Bosciae (Doidge) Stevens, Ann. Myc. 25, p. 435 (1927).

Group number 3401. 4220.

Amphigenous, mostly epiphyllous, forming round black spots 2–5 mm. diameter, often becoming confluent and covering a large part of the leaf surface. Mycelium radiating,

composed of olive brown hyphae 7–9 μ diameter, straight or sub-flexuous; cells usually 18–24 μ long; branches opposite, usually emerging at an acute angle (ca 45°) with the main hyphae; capitate hyphopodia alternate or unilateral, usually one to each cell, rarely opposite, briefly stipitate, usually closely appressed to the hyphae, 14–20 μ long; stipe cell about 3 μ long and 6 μ broad; head cell 8–10 μ broad, usually ovate, truncate or more or less angular or sub-lobed. Mucronate hyphopodia not numerous, usually found in the neighbourhood of the perithecia, on separate short branches, or more frequently interspersed with the capitate hyphopodia, opposite or unilateral, 14–18 × 6–8 μ, ampulliform, with a rather long curved neck. Mycelial setae none. Perithecia scattered, rather numerous, in the early stages radiating, hemispherical in structure, resembling immature perithecia of *Amazonia* (especially 11373), finally black, globose, verrucose 160–200 μ diameter; outer cells of perithecial wall convex, perithecial setae 5 to 12, scattered, straight, slightly curved abruptly or bent just below the tip, pellucid, dark brown, 60–90 μ long, septate, 5–7 μ thick at the slightly bulbous base, and tapering gradually upwards to the blunt apex. Asci 2–3-spored, ovate, briefly pedicellate, evanescent. Spores dark brown, 4-septate cylindrical, broadly rounded at both ends, constricted, usually 35–47 × 15–20 μ, sometimes narrower (12–14 μ).

Hosts: *Maerua sp.*, (*Niebuhria pedunculata* Hochst.), Winkle Spruit, Natal, 6.7.12, Doidge [2510]; Durban, Natal, 15.6.15, Lansdell [9016]; Umgeni, Natal, 16.7.15, Medley Wood [9024]; Kentani, Cape Province, 6.11.15, Pegler [9539]; Durban, 4.8.17, Van der Bijl [11350]; Durban, 7.4.18, Bottomley [11373]; Umkomaas, Natal, 25.4.19, Bottomley [11880]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12321]; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12389]; East London, 19.7.19, Doidge [12406]; Ebb and Flow, Wilderness, George, 10.5.23, Doidge [17124].

?*Maerua sp.*, Kentani, Cape Province, 6.9.15, Pegler [9130] (type of *M. Kentaniensis*).

Capparis corymbifera E. Mey., Rikatli, Portuguese East Africa, Sept. 1918, Junod [11730].

7. **Meliola claviculata** Doidge.

Trans. Roy. Soc. South Africa 8, p. 113 (1920), Pl. 6, Fig. 5.

Syn. *Irenopsis claviculata* (Doidge) Stevens, Ann. Myc. 25, p. 440 (1927).

Group number 3301. 3230.

Amphigenous, producing minute black spots which are closely crowded on the leaf surface, but not confluent. Hyphae brown, undulating, 6–7 μ thick; cells short 12–15 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 17–20 × 8–10 μ, often appressed to the hypha; stipe cell 3–5 μ long; head cell ovate to irregular, rounded or flattened at the apex. Mucronate hyphopodia opposite or unilateral, curved, ampulliform, interspersed with the capitate hyphopodia, 14–20 × 6–7 μ. Mycelial setae none. Perithecia grouped in the centre of the colony, black, globose, verrucose, membranaceous, 200–240 μ diameter; outer cells of perithecial wall convex pellucid. Perithecial setae 3–7, surrounding the false ostiole, pellucid, non-septate, 100–120 × 6–7 μ, not attenuate towards the uncinate or twisted apex. Asci 2-spored evanescent. Spores 4-septate, cylindrical, slightly constricted, rounded at both ends, 35–40 × 15–18 μ; the loculi being somewhat irregular in length and diameter.

Host: *Oncoba sp.*, Quelimane, Portuguese East Africa, 8.9.13, Pole Evans [7388].

8. **Meliola comata** Doidge.

Trans. Roy. Soc. South Africa 8, p. 111 (1920), Pl. 5, Fig. 1; Bothalia 1, pp. 208 and 215 (1924).

Syn. *Meliola Zehneriae* Van der Bijl, Descr. of some South African Fungi II, South African Journ. Sci. 23, pp. 283–284, December (1926).

Irenopsis comata (Doidge) Stevens, Ann. Myc. 25, p. 437 (1927).

Group number 3401. 4230.

Amphigenous, but mostly epiphyllous, forming black spots 1–3 mm. diameter; hyphae fuscous, flexuous, 7–8 μ thick, branches usually opposite, forming an acute angle (ca 45°

with the hypha. Capitate hyphopodia alternate, stipitate, 18–25 μ long; stipe cell 4–6 μ long; head cell ovate or angular, 9–10 μ broad. Mucronate hyphopodia opposite or unilateral, interspersed with the capitate hyphopodia, piriform or ampulliform, neck often curved, 18–20 × 6–7 μ. Mycelial setae none. Perithecia grouped in the centre of the colony, black, globose, carbonaceous, 200–240 μ diameter, outer cells of perithecial wall convex. Perithecial setae numerous (about 20), 100–150 μ long, non-septate, dark brown and 6μ thick at the base, tapering towards the apex which is paler and about 3 μ thick, often more or less incurved, but not uncinate at the tips. Asci 2-spored, evanescent. Spores brown, cylindrical, 4-septate, slightly constricted tapering slightly towards the rounded ends, 40–45 × 15–17 μ.

Host: *Pyrenacantha scandens* Planch., Woodville Forest, George, 11.11.17, Doidge [11020]; Deepwalls, Knysna, 13.5.23, Doidge [17208]; Storms River, Humansdorp District, 15.5.23, Doidge [17192].

This species is badly parasitised by the fungus *Trichothyrium dubiosum* Syd. I have examined a co-type specimen of *M. Zehneriae* sent to me by Dr. John Phillips from Knysna: the host is not *Zehneria* but *Pyrenacantha*, and the fungus identical with *M. comata*.

SECTION C.

Both Mycelial and Perithecial Setae Present.

9. **Meliola argentina** Speg.

Ann. Soc. Cient. Argentina 9, p. 177 No. 72 (1880), Stevens, Ann. Myc. 26, p. 172 (1928).

Syn. *Meliola Cyperi* Pat., Gaillard, Le Genre Meliola, p. 70–71.

Amphigenous, forming velvety black spots up to 5 mm. diameter, often confluent. Hyphae sinuous, 7–9 μ thick, cells 14–20 μ long; branches alternate. Capitate hyphopodia alternate, usually one to each cell, stipitate, 15 to 25 μ long; stipe cell usually short, cylindrical; head cell, ovate, cylindrical or variously sub-lobed, 10–26 μ broad, rounded, truncate or retuse at the apex. Mucronate hyphopodia on separate branches, which are more slender (6–7 μ) and paler than those bearing the capitate hyphopodia, opposite, alternate or unilateral, cylindrical or lageniform, 15–20 × 6–7 μ. Mycelial setae numerous, simple, straight, stout, black 500–900 μ long, 10–15 μ thick and opaque at the base, somewhat attenuate towards the acute apex, which is slightly paler. Perithecia scattered, black, globose, 150–200 μ diameter, verrucose, with 4–6 curved setae round the false ostiole at the apex. Perithecial setae 90–110 × 6–7 μ, dark brown, acute at the tip. Asci evanescent, 2-spored. Spores elliptic-cylindrical, slightly constricted, rounded at both ends, rather light brown, 40–47 × 13–17 μ.

Host: *Cladium Jamaicense*, Crantz, on leaves, Knysna, 9.4.15, J. Phillips [20399].

SECTION D.

Spores 4-Septate, Perithecial Setae none, Mycelial Setae Forked or Toothed.

(*a*) Setae denticulate at the tips, but not with spreading branches.

1. Capitate hyphopodia opposite.....10. *M. capensis.*
2. Capitate hyphopodia alternate.
   - x. Setae not tapering, with 2–5 teeth or incisions on the blunt apex.....11. *M. brachyodonta.*
   - xx. Setae tapering somewhat towards the apex.
     - o. Spores 35–40 μ long.....12. *M. Allophylli.*
     - oo. Spores 40–45 μ long.....13. *M. furcillata.*
     - ooo. Spores 48–55 μ long.....14. *M. palmicola.*

(*b*) Setae with 2 or 3 short, spreading branches less than 20 μ long.....15. *M. Behniae.*

(*c*) Setae usually with 2 longer spreading branches, which may be again 2–3-fid—

1. Capitate hyphopodia, mostly opposite.....16. ***M. bifida.***
2. Capitate hyphopodia opposite or alternate.
   - x. Primary branches of setae 40–50 μ long.....17. ***M. Choristylidis.***
   - xx. Primary branches of setae up to 130 μ long.....18. ***M. leptidea.***
3. Capitate hyphopodia alternate.....19. ***M. Merrillii.***

10. **Meliola capensis** (Kalch. et Cke.) Theiss.

Ann. Myc. 10, p. 19 (1912), Trans. Roy. Soc. South Africa 5, p. 731, Pl. 62, Fig. 27 ; Bothalia 1, p. 71, Fig. 2, Stevens, Ann. Myc. 26, p. 205 (1928).

Syn. *Asterina capensis* Kalch. et Cke. Grevillia 9, p. 32.

Group number 3132. 3222.

Amphigenous, mostly epiphyllous, forming round, velvety black colonies 2–5 mm. diameter, sometimes confluent and covering large areas. Mycelium radiating ; hyphae straight, brown, 6–8 μ thick, cells 10–15 μ long ; branches opposite, usually forming a wide angle with the hyphae (more than 45°). Capitate hyphopodia opposite, usually 2 to each cell, 12–16 μ long, often almost at right angles to the hypha, cylindrical or ovate, straight or more rarely somewhat curved or bent ; head cell rounded at the apex, 7–9 μ broad ; stipe cell very short, 3–3·5 μ. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite, fairly numerous, pyriform, 14–18 μ long. Mycelial setae numerous, straight, dark brown, paler near the apex, not opaque, 300–400 μ long, 6–8 μ thick at the base and tapering somewhat towards the apex ; apex simple, acute, or 2–3 dentate, teeth minute or up to 7 μ long (rarely up to 25 μ), teeth occasionally denticulate at the tips. Perithecia in small groups, black, globose, carbonaceous, 120–200 μ diameter, verrucose ; outer cells of perithecial wall convex or conical. Asci 2-spored, evanescent. Spores 4-septate, brown, cylindrical, broadly rounded at both ends, 33–40 × 13–16 μ.

Host : *Hippobromus alata* E. and Z., Durban 1897, Medley Wood [9519] ; Inanda, Natal, Medley Wood [10354] ; Winkle Spruit, Natal, 13.4.11, Pole Evans [1402] ; Winkle Spruit, 6.7.12, Doidge [2499] ; Verulam, Natal, 3.7.13 [6805] ; Tongaat, Natal, 12.9.13, Van der Bijl [6953] ; Kentani, Cape Province, 7.10.17 and 2.2.15, Pegler [8391 and 8849] ; Umgeni, Natal, 16.7.15, Medley Wood [9034] ; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10882] ; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10969] ; Stella Bush, Durban, 23.9.17, Van der Bijl [11355] ; Umkomaas, Natal, 25.4.19, Bottomley [11888] ; Langholm Estates, Bathurst District, Cape Province, 14.7.19, Doidge [12342] ; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12378] ; Stella Bush, Durban, 11.3.21, Shilz [14700] ; Elandshoek, Transvaal, 20.7.22, Bottomley [15525].

11. **Meliola brachyodonta** Syd. n. sp.

Syn. *Meliola geniculata* Syd. et Butl., var. *macrospora* Doidge, in Trans. Roy. Soc. South Africa 8, p. 109, Pl. 4, Fig. 4 (1920).

Group number 3131. 4231

Epiphyllous, forming at first round to irregular, black spots 1–3 mm. diameter, later becoming more or less effuse and ill-defined. Hyphae brown, undulating, 6–8 μ thick ; cells 16 to 36 μ long, the majority being 16–24 μ ; branches usually alternate, making an acute angle with the hyphae (45° or less). Capitate hyphopodia alternate, stipitate, 16–24 μ long ; stipe cell cylindrical 5–10 μ long × 6–8 μ diameter ; head cell ovate, 10–14 μ diameter. Mucronate hyphopodia not numerous, opposite or unilateral up to 25 μ long, ampulliform, neck straight or curved. Mycelial setae numerous, especially round the perithecia, brown, more or less translucent throughout, paler near the apex, 200–300 μ long, 6–8 thick, not tapering towards the apex, abruptly geniculate near the base, with 2–5 incisions or teeth on the blunt apex. Perithecia more or less grouped near the centre of the colony, black, lobose, verrucose, carbonaceous, 180–240 μ diameter, outer cells or perithecial wall convex

or conical. Asci ovate, very briefly pedicellate, 2-spored. Spores brown, 4-septate, oblong or cylindrical, rounded at both ends, slightly constricted, 40–43 × 16–18 μ.

Host: *Rhus tomentosa* Linn., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10879].

12. **Meliola Allophylli** Doidge n. sp.

Group number 3131. 3222.

Amphigenous, forming small, orbicular, dull-black colonies up to 2·5 mm. diameter, often numerous and coalescing to form larger, irregular blotches. Mycelium brown, radiating, consisting of undulating hyphae 6–7 μ thick; branches alternate; cells 15–27 μ long. Capitate hyphopodia alternate, usually one to each cell, 15–25 μ long, usually antrorse but less frequently perpendicular or even retrorse; stalk cell short, 4–10 μ long; cylindrical or gibbous; head cell irregular, clavate, in the form of an inverted triangle or slightly lobed, 10–17 × 6–14 μ. Mucronate hyphopodia not very numerous, pale, delicate, slender ampulliform, 15–20 × 6–7 μ. Mycelial setae rather numerous, scattered, straight, dark brown, more or less translucent throughout, but paler near the apex, 240–400 μ long, 6–7 μ thick at the base and tapering only slightly upwards; apex simple, acute, or bifid, the teeth minute or up to 30 μ long. Perithecia grouped in the centre of the colony, globose, black, carbonaceous, 120–170 μ diameter, surface cells convex. Asci evanescent. Spores 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, brown, 35–40 × 13–17 μ.

Host: *Allophyllus erosus*, Radkl., East London, Cape Province, 19.7.19, Doidge [12404]; Kowie, Cape Province, 11.8.24, Britten [21009].

13. **Meliola furcillata** Doidge.

Trans. Roy. Soc. South Africa 5, p. 736, Pl. 65, Fig. 39 (1917); Trans. Roy. Soc. South Africa 8, p. 139 (1920); Stevens, Ann. Myc. 26, p. 210 (1928).

Group number 3131. 4223.

Amphigenous, forming thin black spots 2–3 mm. diameter. Hyphae straight or somewhat sinuous, olive brown, 6–8 μ thick; cells mostly 15–21 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 18–23 μ long, stipe cell short, cylindrical, head cell ovoid or sub-cylindrical 10·5–17 × 7–9 μ. Mucronate hyphopodia fairly numerous, interspersed with the capitate hyphopodia, 14–18 μ long, with a rather long neck which is frequently curved. Mycelial setae rather sparse, more numerous in the neighbourhood of the perithecia, once or twice abruptly geniculate near the base, otherwise straight, very variable in length, 240–900 μ long, 7–8 μ thick, dark brown, semi-translucent at the base, sub-torulose often with a slight constriction just below the apex, tapering gradually towards the slightly paler apex. Apex variously toothed, sometimes a single mucronate point or simply 2–3 dentate, sometimes more irregularly notched or teeth again minutely bi-dentate. Perithecia scattered or in small groups, black, globose, verrucose, 160–180 μ diameter. Asci 2-spored. Spores brown, 4-septate, cylindrical, slightly constricted, broadly rounded at both ends, 40–45 × 16–18 μ.

Hosts: *Allophyllus monophylla* Radkl. (= *Schmidelia monophylla*), Haenertsburg, July 1907 [404]; Amanzimtoti, Natal, 10.7.11, Doidge [1573]; Claridge, Natal, 31.5.15, Doidge [8993]; Buccleuch, near Cramond, Natal, 20.4.16, Sim [10148], same locality 17.7.18, Doidge [11577]; Duncairn, near Pietermaritzburg, 13.7.21, Doidge [14951].

Allophyllus melanocarpa Radkl., Town Bush Valley, Pietermaritzburg, 21.3.16, Doidge [9716].

14. **Meliola Palmicola** Wint.

Hedwigia 26, p. 31, 1887. Stevens, Ann. Myc. 26, p. 210 (1928).

Syn: *Meliola contigua* Karst. et Roum. Rev. Myc. 12, p. 77 (1890).

Group number 3131. 5332.

Amphigenous, but mostly epiphyllous, forming black velvety spots 2–6 mm. diameter; these frequently coalesce and form larger irregular blotches. Mycelium formed of freely branching, brown hyphae, which are 6·5–8·5 μ thick, straight or slightly sinuous: cells 17–30 μ long: branches opposite. Capitate hyphopodia alternate, usually one to each cell, stipitate, usually at an angle of about 45° with the hypha, 30–35 μ long and 8·5–10 μ broad: stipe cell 8·5–11·5 μ long, straight, somewhat curved or gibbous: head cell sub-clavate or cylindrical, more rarely irregular in form, smooth or sub-lobed. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, ampulliform, 20–24 × 7–8·5 μ. Mycelial setae very numerous, straight, erect, 300–520 μ long: opaque, black at base and 10 μ thick, tapering gradually to 5–6·5 μ at the more translucent apex; apex symmetrically or asymmetrically 1–4-dentate, teeth 1·5–13 μ long, and occasionally again bidenticulate. Perithecia in groups, concealed amongst the setae, black, globose, verruculose, 220–240 μ diameter. Asci ellipsoid, with a short foot, 4-spored, 56–60 × 30 μ. Spores brown, 4-septate, sub-ellipsoid, slightly constricted, 47–53 × 18–20 μ.

Host: *Phoenix reclinata* Jacq., Port Shepstone, 15.10.12, Pole Evans [5607]: Kentani Cape Province, 29.11.15, Pegler [9170].

15. **Meliola Behniae** Syd. n. sp.

Sub. *Meliola dracaenicola* Pat. et Har., Bothalia 1, p. 72 (1922), Fig. 3.
Group number 3131. 4231.

Amphigenous, black, forming spots 2–5 mm. diameter, easily detachable from the leaf surface. Hyphae brown, straight, 7–9 μ thick: cells 17–20 μ long: branches opposite, numerous, anastomosing. Capitate hyphopodia alternate or unilateral, stipitate, 17–20 × 10–13 μ: stipe cell short, cylindrical, 5–7 μ long: head cell sub-globose. Mucronate hyphopodia numerous, alternate or opposite, interspersed with the capitate hyphopodia, pyriform or ampulliform, with a straight or curved neck, 15–20 × 6–7 μ. Mycelial setae very numerous, stout, erect, abruptly geniculate at the base or taking a broad curve upwards, opaque, 250–350 μ long, 10–11·5 μ thick, dividing near the apex into two or three short spreading branches 10–17 μ long, each of these being usually divided at the apex into two or three small tapering branches 6–10 μ long: occasionally the latter are themselves bidentate. Perithecia not numerous, black, carbonaceous, globose, 250–300 μ diameter. Spores straight, brown, cylindrical, 4-septate, constricted, broadly rounded at both ends, 43–46 × 16 μ.

Host: *Behnia reticulata* F. Didrichs, Woodbush, Northern Transvaal, 3.8.11, Doidge [1779]: Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11848]: Duncairn, near Pietermaritzburg, 13.7.21, Doidge [14955]: Woodbush, Northern Transvaal, 16.9.23, Doidge [17767].

16. **Meliola bifida** Cke.

Grevillea 9, p. 15 (1880): Emend. Doidge Trans. Roy. Soc. South Africa 5, p. 738 Pl. 66, Fig. 41 (1917); Stevens, Ann. Myc. 26, p. 178 (1928).
Group number 3133. 4232.

Chiefly caulicolous, but also on the leaves, forming conspicuous, black, velvety spots. Mycelium dense brown, very freely branched; branches usually opposite: cells 15–25 μ long. Capitate hyphopodia very numerous, crowded, opposite or alternate, 15–18 μ long; head cell sub-cylindrical to ovate, convex, frequently compressed, 11–14 × 7–8 μ. Mucronate hyphopodia, interspersed with the capitate hyphopodia ampulliform with a curved neck, up to 15 μ long. Mycelial setae very numerous, erect, 250–350 μ long, dark brown but not opaque at base, and 8–10 μ thick; paler near apex, bifid: branches 10–19 μ long, 6–7·5 μ thick, simple or bifid; apices acute—in many cases the ultimate apices are bi- or tri-dentate. Perithecia numerous, completely concealed by the setae, black, globose, verrucose, 250–300 μ diameter. Asci 2–3-spored. Spores brown, 4-septate, cylindrical, rounded at both ends, slightly constricted, 42–50 × 14–16 μ.

Host : *Osyridicarpus natalensis* DC., Springfield, Natal, 14.7.15, Medley Wood [9020] ; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12326] ; Winters Kloof, Natal, 13.9.19, Doidge [12443] ; Karkloof, near Pietermaritzburg, 14.7.21, Doidge [14956].

17. **Meliola Choristylidis** Doidge.

Bothalia 2, pp. 236–7, Fig. 4 (1927).

Group number 3143. 3221.

Epiphyllous, colonies round or irregular in outline, black, 4–10 mm. in diameter. Mycelium forming an open network composed of straight, brown hyphae, 6·5–7·5 μ thick ; cells 15–40 μ long ; branches opposite. Capitate hyphopodia opposite, alternate or unilateral, usually one or a pair to each cell, 14–18 μ long, 8·5–10 μ broad ; stipe cell cylindrical, short ; head cell smooth, ovate or ovate-oblong. Mucronate hyphopodia abundant in the older parts of the colony, interspersed with capitate hyphopodia, opposite, bottle-shaped or flask-shaped, 14–17 × 6·5 μ neck, rather thick, straight or slightly curved. Mycelial setae abundant around the perithecia, 200–250 μ high, dark brown, and 6·5–10 μ thick at the base, tapering towards the tips and becoming lighter in colour, once to four times dichotomous, the first branching being 120–150 μ from the base ; primary branches at right angles to one another, or more widely divergent ; secondary and tertiary branches, when present, usually almost at right angles ; primary and secondary branches 40–50 μ long ; further branches usually shorter, and ultimate branches often not more than 5–6 μ long. Perithecia scattered, black, globose, 150–175 μ diameter, verrucose ; outer cells of perithecial wall rounded or conical, 10–14 μ diameter. Asci 2-spored, evanescent. Spores brown, oblong, 4-septate, broadly rounded at both ends slightly constricted, 36–40 × 13–15 μ.

Host : *Choristylis rhamnoides* Harv., Woodbush Northern Transvaal, 16.9.23, Doidge [17733].

18. **Meliola leptidea** Syd.

Ann. Myc. 10, p. 38 (1912) ; Trans. Roy. Soc. South Africa 5, p. 739, Pl. 66, Fig. 42 (1917) ; Stevens, Ann. Myc. 26, p. 180 (1928).

Group number 3143. 5231.

Epiphyllous, forming velvety black colonies, 2–4 mm. diameter, frequently confluent. Hyphae branched, chestnut brown, 8–11 μ thick ; branches opposite, emerging at an acute angle with the main hyphae ; cells 10–30 μ long. Capitate hyphopodia very numerous, closely crowded, opposite or alternate, 18–28 μ long ; head cell ovate or globose, 10–15 μ thick. Mucronate hyphopodia less numerous, up to 25 μ long. Perithecia grouped in the centre of the colony but not crowded, black, globose, collapsing somewhat when dry, asperulous, 250–300 μ diameter. Mycelial setae very numerous, 200–300 μ long, 8–11 μ thick and opaque at the base, dividing into two long (up to 130 μ) spreading, slightly incurved branches ; these branches being again divided into two branches of varying length (30–38 μ), bifurcate at the apex. Asci ovate, 50–60 × 28–40 μ, 2–3-spored. Spores oblong, broadly rounded at both ends, 4-septate, constricted, chestnut brown, 45–55 × 15–20 μ.

Host : *Cussonia spicata* Thun., Woodbush, Northern Transvaal, 21.7.07, Legat [105] ; Helpmekaar, Woodbush, 3.8.11, Doidge [1774], same locality 16.9.23, Doidge [17759].

19. **Meliola Merrillii** Syd.

Phil. Journ. Sci. C. Bot. 8, p. 479 (1913) ; Stevens, Ann. Myc. 26, p. 181 (1928).
Syn. *Meliola varia* Doidge, Trans. Roy. Soc. South Africa 5, p. 738, Pl. 65, Fig. 40 (1917).

Group number 3141. 4221.

Amphigenous, but mostly epiphyllous, forming small, velvety black spots 1–8 mm. diameter, later becoming confluent and more or less effuse. Mycelium branching, anastomosing, brown, composed of hyphae 8–10 μ thick ; branching irregular. Capitate

hyphopodia alternate, 20–26 μ long: stipe cell short: head cell globulose or very slightly lobed, 14–16·5 μ long and 10–14 μ broad. Mucronate hyphopodia rare, opposite, pale, slender ampulliform, up to 24 μ long. Mycelial setae very numerous, 160–220 μ long, 9–11 μ thick at the base, septate, opaque or sub-opaque, above divided into two spreading branches 18–70 μ long and about 8 μ thick; each of these again bi- or tridentate, or divided into two to three smaller branches, which are again bi- or tridentate at the apex. Perithecia scattered, black, glabose, 140–180 μ diameter. Asci ovate, 2–3-spored. Spores oblong, 4-septate, constricted, brown, broadly rounded at both ends, 40–45 × 15–17 μ.

Host: *Rhoicissus rhomboidea* E. Mey., Winters Kloof, Natal, 13.7.11, Doidge [1639]; Town Bush Valley, Pietermaritzburg, 21.3.16, Doidge [9717]; Buccleuch, near Cramond, Natal, 20.4.16, Sim [10145], 20.7.18, Leighton [11554]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12319]; Woodbush, Northern Transvaal, 17.9.23, Doidge [17730].

SECTION E.

No Perithecial Setae; Mycelial Setae Uncinate or Falcate.

A.—Apex of setae acute or sub-acute.

Spores 14–16 μ broad.....20. ***M. arcuata.***

Spores 16–20 μ broad.....21. ***M. woodiana.***

B.—Apex of setae obtuse.

Capitate hyphopodia very rudimentary.....22. ***M. cladophila.***

Capitate hyphopodia well developed—

Setae uncinate.....23. ***M. petiolaris.***

Setae falcate.....24. ***M. Cluytiae.***

20. **Meliola arcuata** Doidge.

Trans. Roy. Soc. South Africa 5, p. 737, Pl. 66, Fig. 37 (1917); Stevens, Ann. Myc. 26, p. 217 (1928).

Group number 3121. 5222.

On the cladodes forms small velvety black, round-irregular colonies, 1–2 mm. diameter. Mycelium dense, composed of brown hyphae, which are straight or sinuous, 10–11 μ thick, and with short articulations; cells 10–20 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 20–30 × 10–14 μ; head cell irregularly ovate or oblong, dentate or sub-lobed, straight or curved, often appressed to the hypha. Mucronate hyphopodia not numerous, opposite, ampulliform, 13–20 × 7–10 μ. Mycelial setae numerous, simple, arcuate, flexuous or more rarely almost straight, black, opaque except near the apex, 250–350 μ long and of uneven thickness (7–11 μ); apex acute. Perithecia hidden amongst the mycelial setae, black, globose, carbonaceous, minutely verrucose, 120–150 μ diameter. Asci 2-spored, evanescent. Spores ellipsoid-oblong, rounded at both ends, 4-septate, slightly constricted, 50–54 × 14–16 μ.

Host: *Viscum anceps* E. Mey., on cladodes, Kentani, 1.6.12 and 4.8.14, Pegler [2364 and 8389].

21. **Meliola woodiana** Sacc.

Hedwigia 38, p. 132 (1899), Trans. Roy. Soc. South Africa 5, p. 737, Pl. 64, Fig. 38 (1917). Stevens, Ann. Myc. 26, p. 258 (1928).

Syn. *Meliola falcata* Syd., Ann. Myc. 10, p. 37 (1912): Trans. Roy. Soc. South Africa 5, p, 736, Pl. 66, Fig. 36 (1917).

Group number 3121. 5222.

Amphigenous, but most frequently epiphyllous, forming velvety black, orbicular colonies 2–4 mm. diameter, often confluent and then forming larger, irregular blotches. Mycelium radiating, consisting of straight or sub-sinuous hyphae 6–8 μ thick; cells 18–30 μ long, branches opposite. Capitate hyphopodia alternate, usually one to each cell, 22–30 μ long, stipe cell tapering towards the base, head cell 7–11 μ broad, ovate or slightly angular.

Mucronate hyphopodia on separate short branches, not numerous 11–18 μ long, ampulliform, with a rather short, thick neck. Mycelial setae very numerous, simple, curved, often falcate 175–400 μ long, opaque and 7–9 μ thick at the base, tapering gradually to the more translucent apex: apex acute or sub-acute. Perithecia hidden amongst the numerous mycelial setae, black, globose, verrucose, 200–230 μ diameter. Asci 2–4 spored. Spores oblong, brown, rounded at both ends, 4-septate, constricted, 38–51 × 16–20 μ.

Hosts: *Plectronia ventosa* Linn. Durban, Natal, Medley Wood 6467 [9508] (=type of *M. Woodiana* ?): Amanzimtoti, Natal, 10.7.11, Doidge [1577] (=type of *M. falcata*): Durban, 2.7.11, Pole Evans [1591]: Tongaat, Natal, 12.9.13, Van der Bijl [6952]: Winkle Spruit, Natal, 28.5.15, Doidge [9005]: Springfield, Natal, 14.7.15, Medley Wood [9017]: Kentani, Cape Province, 7.6.15, Pegler [9128]: Van Stadens Pass, Cape Province, 13.11.17, Doidge [10881]: East London, 24.11.17, Doidge [10920]: Durban, 11.8.17, Van der Bijl [11359]: Stella Bush, 19.7.18, Bottomley [11383]: Durban, Bottomley [11385]: Umkomaas, Natal, 25.4.19, Bottomley [11882 and 11890]: Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12290]: Keurkloof Forest, George, 9.5.23, Doidge [17110]; Deepwalls, Knysna, 13.5.23, Doidge [17219]; Van Stadens Pass, 19.5.23, Doidge [17257].

Plectronia Mundtiana Pappe., Umkomaas, Natal, 25.4.19, Bottomley [11883].

Plectronia spinosa Klotsch., Mayville, Natal, 23.7.15, Medley Wood [9030]; Woodville Forest, George, 11.11.17, Doidge [10956]: Grahamstown, June 1919, Britten [12189]: Howiesons Poort, Grahamstown, 12.7.19, Doidge [12390]; Keurkloof Forest, George, 9.5.23, Doidge [17119].

Plectronia ciliata Sond., Woodville Forest, George, 11.11.17, Doidge [10936].

Medley Wood's specimen which is labelled *Meliola Woodiana* Sacc. (Wood [6467], Colonial Herbarium [7771]) Nat. Herb. [9508], is apparently the type of this species. Unfortunately Wood's number is not quoted in Hedwigia, but there seems to be no doubt whatever that the host is *Plectronia ventosa*.

There is no essential difference between the above specimen (which is badly parasitised) and *M. falcata*. The spores are slightly larger than those of the type of *M. falcata*, but the size of the spores varies in different collections and spores of a length of at least 50 μ are not uncommon.

This is a very conspicuous species and occurs commonly.

22. **Meliola cladophila** Syd.

Ann. Myc. 22, p. 421 (1924). Stevens, Ann. Myc. 26, p. 214 (1928).
Group number 3121. 4242.

Ramicolous, forming extremely velvety, dense black spots 2–8 mm. long. Mycelium consisting of very densely interwoven hyphae with numerous short branches: hyphae variable, chestnut brown, short or very short, 6–9 μ thick, septate, nodulose. Hyphopodia few, rudimentary. Mycelial setae very numerous, simple, almost always more or less curved, falcate or S-shaped, rarely almost straight, 300–350 μ long, 11–16 μ thick, very black over the whole surface, or slightly paler just at the apex, tapering slightly, but often on the contrary slightly thickened at the apex, always broadly rounded. Perithecia fairly numerous, almost entirely hidden among the setae, globose, smooth, 275–325 μ diameter. Asci 2–3-spored. Spores oblong, straight or slightly curved, usually tapering slightly towards both ends, but obtuse at the apices, brown, 1-septate, more or less constricted, 12–17 × 17–20 μ: cells often unequal, medial cell almost always larger, chiefly in the breadth.

Host: *Apodytes dimidiata* E. Mey., on branches, Woodbush, Transvaal, July 1924, leg. Van der Bijl (Van der Bijl [1661]).

Not represented in the National Herbarium.

23. **Meliola petiolaris** Doidge.

Trans. Roy. Soc. South Africa 8, p. 142, Pl. 8, Fig. 7 (1920). Stevens, Ann. Myc. 26, p. 216 (1928).

Group number 3121. 4231.

Hypophyllous, along leaf margins and veins and on petioles, occasionally also on the twigs; on the leaves forming round or elongated black spots up to 7 mm. diameter or 12 × 6 μ; on the petioles forming a dense black mat which readily separates from the substratum. Hyphae brown, 5–6·5 μ diameter, almost straight, cells 25–30 μ long, branches opposite or alternate. Capitate hyphopodia alternate or unilateral, very variable in length, slender, 15–40 μ long and 10–13 μ broad; stipe 1–2-celled, 6–20 μ long, cylindrical or tapering towards the base; head cell obovate, flattened or sub-lobed, straight or curved. Mucronate hyphopodia not seen. Mycelial setae very numerous, especially on the petioles, forming a dense mat in which the perithecia are concealed, less numerous on the lamina, simple, uncinate, opaque, 150–250 μ long, 8–9 μ thick at the base and tapering somewhat towards the blunt apex. Perithecia numerous, black, globose, carbonaceous, 200–250 μ diameter, minutely verrucose. Asci 2-spored, evanescent. Spores 4-septate, cylindrical, rounded at both ends, slightly constricted, 40–44 × 13–16 μ, the middle cell usually slightly longer than the lateral ones.

Hosts: *Olea laurifolia* Lam., Buccleuch, near Cramond, Natal, 17.7.18, Doidge [11558]. *Olea capensis* Linn., Storms River, Humansdorp District, 15.5.23, Doidge [17173A].

24. **Meliola Cluytiae** Van der Bijl.

South African Journ. Sci. 23, p. 283 (1926).

Group number 3121. 5222.

Colonies mostly epiphyllous, black, orbicular 1 to 2 mm. diameter. Mycelium radiating; hyphae dark brown, 10–12 μ diameter, individual cells 12–28 μ long, branching opposite. Capitate hyphopodia alternate, pedicellate, 28 μ long; head cell globose 12 μ × 12–16 μ. Mucronate hyphopodia 12 μ long, 8–11 μ diameter at base and narrowing suddenly near the apex into a neck 4 μ in diameter. Mycelial setae abundant, falcate, 340–400 μ long, 9–12 μ diameter at the base, tapering gradually to 4 μ at the apex; apex obtuse. Perithecia globose, black, 166 μ diameter. Spores 4-septate, cylindrical, constricted, rounded at both ends, 44–52 × 12–16 μ.

Host: *Cluytia pulchella* Linn., Knysna, Cape Province, Van der Bijl 2317.

This species is not represented in the National Herbarium, and as no specimen has been available for study the original description is quoted.

SECTION F.

No Perithecial Setae, Mycelial Setae Simple and Straight.

A.—Capitate hyphopodia usually opposite.

(*a*) Apex of setae acute.

1. Spores 45–50 × 20–23 μ. ..... 15. *M. Toddaliae.*
2. Spores 40–45 × 16–20 μ. ..... 26. *M. Azimae.*

(*b*) Apex setae blunt or acuminate.

1. Spores 50–60 × 16–20 μ. ..... 27. *M. gemellipoda.*
2. Spores 44–50 × 16–18·5 μ. ..... 28. *M. transvaalensis.*

B.—Capitate hyphopodia opposite, alternate or unilateral.

(*a*) Spores 30–40 μ long.

1. Hyphae sinuous; head cell of capitate hyphopodia globose. ..... 29. *M. Indigoferae.*
2. Hyphae straight, head cell cylindrical, often curved. .30. *M. Ochnae.*

(*b*) Spores 40–50 μ long.

1. Apex of setae acute. ..... 31. *M. rigida.*
2. Apex of setae blunt. ..... 32. *M. buxicola.*

C.—Capitate hyphopodia usually alternate.

(*a*) Capitate hyphopodia more or less lobed or hooked.

1. Apex of setae acute.

o. Spores 35–40 μ long.....33. *M. Excoecariae.*

oo. Spores 40–50 μ long.....

x. Branches opposite, capitate hyphopodia mostly entire and uncinate.....34. *M. Cnestidis.*

xx. Branches alternate, capitate hyphopodia usually sub-lobed.

.. Mycelial setae numerous, scattered.35. *M. rhoina.*

... Mycelial setae not numerous, grouped round perithecia.....36. *M. microthecia.*

ooo. Spores 48–55 μ long, branches opposite, rectangular.....37. *M. sinuosa.*

2. Apex of setae blunt or acuminate.

o. Spores 40–50 μ long.

x. Branches usually opposite.

.. Capitate hyphopodia 16–20 μ long.38. *M. Panici.*

... Capitate hyphopodia 18–30 μ. long.39. *M. Carissae.*

xx. Branches alternate or irregular.

... Spores 17–20 μ broad.....40. *M. Loxostylidis.*

oo. Spores 50–70 μ long.

x. Surface cells of perithecia convex.....41. *M. Cryptocaryae.*

xx. Surface cells very large, mammillate.....42. *M. torta.*

(*b*) Capitate hyphopodia not lobed.

1. Apex of setae acute.

o. Spores 35–45 μ long.....43. *M. Doidgeae.*

oo. Spores 45–50 μ long.....44. *M. oleicola.*

ooo. Spores 50–60 μ long.....45. *M. polytricha.*

2. Apex of setae blunt or acuminate.

o. Spores 25–35 μ long.....46. *M. Psychotriae.*

oo. Spores 35–40 μ. long.

x. Head cell of capitate hyphopodia globose.47. *M. Popowaie.*

xx. Head cell cylindrical.....48. *M. dactylipoda.*

ooo. Spores 40–50 μ long.

x. Capitate hyphopodia 12–16 μ long.....49. *M. cylindripoda.*

xx. Capitate hyphopodia 20–35 μ long

.. Capitate hyphopodia 13–17 μ broad.50. *M. Knowltoniae.*

.. Capitate hyphopodia 7–12 μ broad.

/. Immature perithecia radiating in structure.....51. *M. Goniomae.*

//. Immature perithecia not radiating.

$. Hyphae 6–8 μ thick...52. *M. Osyridis.*

$$. Hyphae 8–10 μ thick..53. *M. littoralis.*

25. **Meliola Toddaliae** Doidge.

Trans. Roy. Soc. South Africa 5, p. 732, Pl. 63, Fig. 28 (1916): Bothalia 1. p. 209 (1924); Stevens, Ann. Myc. 26, p. 230 (1927).

Group number 3112. 4332.

Amphigenous, forming black, circular velvety spots 2–5 mm. diameter, very easily detached from the leaf. Mycelium rather dense, formed of fuscous hyphae 7–10 μ thick; cells 10–20 μ long; branches usually opposite, occasionally unilateral, anastomosing, usually very pale near the tips. Capitate hyphopodia opposite, crowded, usually two to each cell, stipitate, 16–20 μ long; stipe cell cylindrical, 3–7 μ long and about 7 μ thick;

head cell sub-ovate or cylindrical, straight or somewhat curved, rounded at the apex, or flattened in various directions by contact with other hyphopodia, 14–16 μ long and 8–10 μ thick. Mucronate hyphopodia not numerous, opposite, ampulliform, with a short thick neck, which is usually more or less curved, 18–20 × 8–10 μ. Mycelial setae very numerous, simple, straight, erect, opaque at the base, slightly translucent near the apex, 300–350 μ long, 8–10 μ thick at the base, and tapering only slightly upwards: apex acute or acuminate: There are often more or less pronounced constrictions in the setae, particularly near the apex, which at times give it an almost torulose appearance. Perithecia rather numerous, scattered, hidden among the setae, black, globose, verrucose, 200–250 μ diameter, outer cells of perithecial wall rounded or conical, and up to 15 μ diameter. Asci 3–4-spored. Spores 4-septate, cylindrical or somewhat ellipsoid, rounded at both ends, slightly constricted, 45–50 × 20–23 μ, usually broader at the middle than at the ends.

Hosts: *Vepris lanceolata* G. Don. (=*Toddalia lanceolata* Lamk.), Kentani, Cape Province, 17.12.14, Pegler [8788]; Henley, Natal, 24.5.15, Doidge [8999]; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10860]; Stella Bush, Durban, 23.9.17, van der Bijl [11353], Stella Bush 19.4.18, Bottomley [11371]; Buccleuch, Natal, 17.7.18, Doidge [11564]; Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [118427]; Umkomaas, Natal, 25.4.19, Bottomley [11881]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12324]; East London, 19.7.19, Doidge [12418]; Karkloof, near Pietermaritzburg, 14.7.21, Doidge [14954]; Wilderness, George, 10.5.23, Doidge [17113]; Van Stadens Pass, 19.5.23, Doidge [17260].

Teclea natalensis Engl. (=*Toddalia natalensis* Sond.), Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12287].

Fagara capensis Thun. (=*Xanthoxylon capense* Harv.), Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12275]; Winters Kloof, Natal, 13.9.19, Doidge [12440]; Haenertsburg, 14.9.23, Doidge [17774].

Fagara Davyi Verdoorn, Knysna, Cape Province, February 1922, Keet [15531].

26. **Meliola Azimae** Doidge n. sp.
Group number 3112. 4233.

Amphigenous and caulicolous, but mostly epiphyllous: spots sub-circular, black, scattered, up to 3 mm. diameter, often becoming confluent and thus forming larger irregular blotches. Mycelium rather dense, formed of almost straight, fuscous hyphae, 7–10 μ thick, often slightly constricted at the septa: cells 20–35 μ long: branches opposite. Capitate hyphopodia usually opposite, but alternate or unilateral hyphopodia are not infrequent, 16–24 μ high and 6–7 μ thick, straight or somewhat curved or hooked; stipe cell short, cylindrical: head cell usually cylindrical, with truncate or rounded apex, but sometimes more or less club-shaped or hooked. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, 15–18 × 6–7 μ, broadly ampulliform, with a short neck. Mycelial setae rather numerous, simple and straight, black, opaque almost to the tip, very variable in length, 240–640 μ long, 10–12 μ thick at the base, and tapering slightly near the acute apex. Perithecia fairly numerous, grouped in the centre of the spot, black, globose, carbonaceous, 160–250 μ diameter: surface cells slightly convex, collapsing at maturity. Asci 2–3-spored, evanescent. Spores dark brown, 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, 43–50 × 16·5–20 μ.

Host: *Azima tetracantha* Lam., East London, Cape Province, 23.7.27, Doidge [22387].

Very closely related to *M. rigida*, from which it differs slightly but distinctly in the form of the hyphopodia.

27. **Meliola gemellipoda** Doidge.

Bothalia 1, p. 80 (1922); Stevens, Ann. Myc. 26, p. 229 (1928).
Group number 3112. 5233.

Epiphyllous, forming round, black velvety spots 1–5 mm. diameter. Mycelium compact, fairly dense, formed of straight or slightly wavy hyphae, 7–10 μ thick; cells 20–30 μ long, branching opposite or irregular. Capitate hyphopodia opposite, usually two to each cell of the hypha, 16–23 × 9–10 μ; stipe cell short, cylindrical, 3–5 μ long; head cell cylindrical or sub-ovate, rounded at the apex. Mucronate hyphopodia rare, interspersed with the capitate hyphopodia, ampulliform, 20–30 μ long × 10 μ thick at the base. Mycelial setae fairly numerous, simple, straight, black, opaque except near the apex, 360–600 μ long, 9–10 μ thick at the base, and tapering gradually towards the apex, which is rather blunt or acuminate. Perithecia 200–250 μ diameter, black, globose, rather rough but not conspicuously verrucose. Asci 2–3-spored, evanescent. Spores 4-septate, cylindrical, or tapering slightly towards both ends, sometimes slightly asymmetrical and broader at one end than the other, rounded at both ends, slightly constricted, 50–60 × 16–20 μ.

Host: *Jasminum angulare* Vahl., Langholm Estates, Bathurst Dist., Cape Province, 14.7.19, Doidge [12352].

Closely related to *M. Toddaliae*; the spores are longer and narrower in proportion, and the setae more tapering, with less acute apex.

28. **Meliola transvaalensis** Doidge.

Bothalia 2, p. 152 (1927).

Group number 3112. 4233.

Amphigenous, forming black spots 2–5 mm. diameter; mycelium dark brown, dense; hyphae 7–10 μ thick; cells 16–20 μ long; branches usually opposite. Capitate hyphopodia opposite, crowded, usually 2 to each cell, at right angles to or appressed toward the hyphae, 15–20 μ long; stipe cell cylindrical, very short, 3–5 μ long; head cell ovate or flattened by contact, 10–13 μ broad. Mucronate hyphopodia rare, ampulliform, with a curved neck, 16–23 × 6–7 μ. Mycelial setae black, opaque, simple, mostly grouped in the neighbourhood of the perithecia, 450–650 μ long, 10 μ thick at the base, and tapering gradually to a blunt apex. Perithecia crowded in the centre of the colony, black, carbonaceous, globose, 250–290 μ diameter, cells of the outer wall rounded or conical. Asci not seen. Spores oblong, 4-septate, broadly rounded at both ends, very slightly constricted, 44–50 × 16–18·5 μ.

Host: *Myrsine africana* Linn., Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17746].

Parasitised by *Spegazzinia sp.*

29. **Meliola Indigofera** Syd. n. sp.

Sub. *M. Malacotricha* Speg., Trans. Roy. Soc. South Africa 8, p. 108, Pl. 4, Fig. 1 (1920); Stevens, Ann. Myc. 26, p. 227 (1928).

Group number 3113. 4231.

Mostly hypophyllous, forming round or irregular spots 1–4 mm. diameter, often confluent and covering a great part of the leaf surface. Hyphae sinuous, brown, 5–7 μ thick, composed of cells 25–30 μ long; branches opposite; capitate hyphopodia opposite, alternate or unilateral, 14–16 × 7–10 μ, briefly stipitate; terminal cell ovoid or globular; mucronate hyphopodia interspersed with the capitate hyphopodia, opposite, narrow-ampulliform, 12–15 μ long. Mycelial setae fairly numerous, incurved, and bent at right angles at the base or at some other point in their length, becoming insensibly narrower towards the acute translucent apex, 150–300 × 5–10 μ. Perithecia in small groups in the centre of the spot, globular, then depressed, black, minutely verrucose, 150–220 μ diameter. Asci 2-spored. Spores 4-septate, cylindrical, straight or slightly curved, slightly constricted at the septa, and slightly attenuated towards the rounded extremities, 30–38 × 12–15 μ. Spores occasionally up to 42 μ long.

Hosts: *Indigofera natalensis* Bolus, Buccleuch, Natal, 23.3.16 and 17.7.18, Doidge [9703 and 11560], same locality 20.4.16, Sim [10144].

Baphia racemosa Hochst., Sea View, Durban, 1.10.17, van der Bijl [11354].

30. **Meliola Ochnae** Doidge.

Trans. Roy. Soc. South Africa 8, p. 141, Pl. 8, Fig. 6 (1920): Stevens, Ann. Myc. 26, p. 277 (1928).

Group number 3113. 3222.

Amphigenous, forming irregular spots 4–8 mm. diameter: hyphae fuscous, nearly straight, 5–6 μ thick: cells usually 20–25 μ long: branches opposite or irregular. Capitate hyphopodia alternate, opposite or unilateral, 12–16 × 6–7 μ, briefly stipitate: head cell cylindrical or ovate, often uncinate, rounded at the apex. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or scattered, ampulliform: neck straight, oblique or curved, and about equal in length to the base, 15–20 × 6 μ. Mycelial setae not numerous except near the perithecia, simple, straight or flexuous, often sub-crenulate, especially near the tip, 240–350 μ long, translucent throughout, 6–7 μ thick at the base and tapering gradually to the apex, which may be blunt or acute. Perithecia not numerous, scattered, black, globose, membranous verrucose, 140–180 μ diameter: superficial cells strongly convex or irregularly conical. Asci evanescent. Spores 4-septate, brown, ellipsoid, rounded at both ends, constricted, 35–37 × 12–15 μ.

Hosts: *Ochna natalitia* Engl. et Gilg., Winter's Kloof, Natal, 1.6.15, Doidge [8989]; Buccleuch Natal, 20.4.16, Sim [10143]; Buccleuch, 17.7.18, Doidge [11567].

Ochna O'Connorii Phillips, Woodbush, Northern Transvaal, 18.9.23, Doidge [17742].

This species is not plentiful on the host and is often parasitised.

31. **Meliola rigida** Doidge.

Trans. Roy. Soc. South Africa 5, p. 736, Pl. 64, Fig. 35 (1916). Stevens, Ann. Myc. 26, p. 230 (1928).

Group number 3113. 4233.

Amphigenous, forming rusty black spots of varying size, hyphae rigid, brown 7–9 μ thick, composed of cells 18–25 μ long; branches opposite, usually at right angles to the hypha. Capitate hyphopodia mostly opposite, but sometimes unilateral or alternate or mostly alternate or unilateral, 14–23 μ long: stipe cell cylindrical, very short, 3–5 μ long; head cell sub-globose, ovate or cylindrical, 8–10 μ broad. Mucronate hyphopodia not very numerous, opposite, paler, 18 μ long, narrowed above into a short neck. Mycelial setae fairly numerous, black, opaque almost to the acute apex, straight, simple, 250–750 μ long, 10–11 μ thick at the base. Perithecia scattered, black, globose, not conspicuously verrucose, 180–220 μ diameter: superficial cells slightly convex. Asci ovate, briefly stipitate, 2–3-spored. Spores brown, 4-septate oblong, broadly rounded at both ends, constricted, 40–45 × 16–20 μ.

Host: *Xymalos monospora* Paill., Winters Kloof, Natal, 27.6.11, Doidge [1667]; Woodbush, Northern Transvaal, 3.8.11, Doidge [1775]; Tabankulu, Transkei, 15.3.15, Fraser [8890]; Buccleuch, Natal, 18.3.15, Pole Evans [8894]; Winters Kloof, Natal, 1.6.15, Doidge [8988]; Buccleuch, Natal, 17.7.18, Doidge [11578]; Zwartkop, near Pietermaritzburg, 19.7.18, Doidge [11599]; Rikatli, Portuguese East Africa, Junod [11614]; Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11841]; Winters Kloof, Natal, 13.9.19, Doidge [12444]; Haenertsburg, 14.9.23, Doidge [17720].

The material is nearly all very poor and parasitised. In some localities it is associated with *Trichopeltula* sp. In some collections, alternate or unilateral hyphopodia preponderate, and in these colonies the length of the hyphopodia is somewhat greater than in those where they are opposite.

32. **Meliola buxicola** Doidge n. sp.

Group number 3113. 4332.

Amphigenous, but mostly epiphyllous, forming sub-circular, black velvety spots up to 5 mm. diameter. Mycelium radiating, composed of almost straight, brown hyphae 6·5–8 μ thick; cells 13–20 μ long; branches opposite. Capitate hyphopodia opposite

alternate or unilateral, one or two to each cell, 15–20 μ high or occasionally up to 24 μ; stipe cell short, cylindrical: head cell sub-globose or less frequently clavate-cylindrical about 10 μ diameter. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, opposite or solitary 15–18 × 6–8 μ, ampulliform with a straight or curved neck. Mycelial setae numerous, simple, straight, 200–350 μ long, 7–9 μ thick and opaque at the base, and tapering gradually to the blunt, translucent apex. Perithecia fairly numerous, scattered, black, globose, carbonaceous, 200–250 μ diameter, collapsing at maturity, surface cells convex to conical. Asci evanescent, not seen. Spores brown, 4-septate, cylindrical or sub-ellipsoid broadly rounded at both ends, slightly constricted, 43–47 × 16·5–22 μ.

Host: *Buxus MacOwani* Oliv., East London, 23.7.27, Doidge [22388].

33. **Meliola Excoecariae** Doidge.

Trans. Roy. Soc. South Africa 8, p. 139, Pl. 7, Fig. 3 (1920). Stevens, Ann. Myc. 26, p. 284 (1928).

Group number 3111. 3222.

Amphigenous, forming round or irregular spots 5–10 μ diameter: hyphae fuscous, gently undulating, 6–8 μ thick: branches usually alternate: cells varying in length, 15–40 μ. Capitate hyphopodia alternate, stipitate, usually one to each cell, 23–35 × 10–16 μ; stipe cell 7–10 μ long, tapering somewhat towards the base, occasionally sub-lobed: head cell variously lobed, usually obtusely 3-lobed or triangular, lobes truncate, retuse or rounded. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or scattered, slender ampulliform or pyriform, 15–20 × 6–7 μ. Mycelial setae not numerous, 300–500 μ long, opaque and 6–7 thick at the base, not tapering, apex acute, somewhat translucent. Perithecia black, globose, carbonaceous, 145–170 μ diameter (?mature). Asci evanescent. Spores 4-septate, cylindrical, rounded at both ends, very slightly constricted, 35–40 × 13–17 μ.

Host: *Sapium Simii* O. Kuntze (=*Excoecaria caffra* Sim), Buccleuch, Natal, 17.7.18, Doidge [11566].

The material is badly parasitised, and only small colonies can be found which are free from parasites.

34. **Meliola Cnestidis** Doidge n. sp.

Group number 3111. 4222.

Amphigenous, forming round to irregular black spots up to 5 mm. diameter: mycelium rather dense, composed of closely interwoven hyphae. Hyphae fuscous, conspicuously undulating, 6–8 μ thick, branches usually opposite and at right angles to the hypha: cells 20–30 μ long. Capitate hyphopodia alternate or unilateral, occasionally opposite, usually one to each cell, 18–30 μ long, stipe 5–16 μ long, occasionally septate, usually cylindrical, but sometimes become gradually narrower from the base upwards: head cell 6–16 μ broad, usually entire and incurved, recurved or hooked, less frequently straight and forming an inverted triangle or sub-lobed. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, ampulliform, with a straight or curved neck, 16–20 × 6–7 μ. Mycelial setae fairly numerous, especially in the neighbourhood of the perithecia, simple, straight, black, opaque except near the tip which is more or less translucent 250–350 μ long, 7–8 μ thick at the base, not tapering or very slightly so, apex acute. Perithecia scattered, black, globose, carbonaceous, 150–200 μ diameter, minutely verrucose. Asci 2–3-spored evanescent. Spores oblong to cylindrical, dark brown, 4-septate, rounded at both ends, slightly constricted, 42–47 × 15–17 μ.

Host: *Cnestis natalensis* Planch and Sond., Kentani, Cape Province, 10.12.15 and 10.4.15, Pegler [9076 and 9527]: Springfield, Natal, 16.7.15, Medley Wood [9035].

35. **Meliola rhoina** Doidge.

Sub. *Meliola Rhois* P. Henn., Trans. Roy. Soc. South Africa 5, p. 733, Pl. 63, Fig. 31 (1917). Stevens, Ann. Myc. 26, p. 284 (1928).

Group number 3111. 4232.

Amphigenous, forming small, black, velvety spots 1–3 mm. diameter, these are frequently numerous and confluent, covering the greater part of the leaf surface. Mycelium radiating, rather dense, hyphae brown, 7–10 μ thick, more or less undulating, and occasionally sub-torulose; branching alternate or irregular, branches forming an acute angle with the main hyphae: cells usually 17–30 μ long. Capitate hyphopodia alternate, usually one to each cell, straight or curved 18–33 μ long; stipe cell cylindrical or tapering somewhat towards the base, 6–10 μ long: head cell very variable in form, 10–15 μ broad, more or less ovate, usually sub-lobed, rounded or truncate at the apex. Mucronate hyphopodia not very numerous on separate branches, paler, opposite, ampulliform with a thin neck, 18–22 $\times$ 8–10 μ. Mycelial setae rather numerous, scattered, erect, simple, straight, opaque at the base, more translucent near the apex, 280–400 μ long, 7–9 μ thick at the base, not tapering or very slightly so, apex acute (apex very rarely bi-furcate, only 3 have been seen on different slides, with bi-furcate tips). Perithecia scattered or in groups, black, globose, verrucose 180–240 μ diameter. Asci elliptic-ovate with a very short foot, 2–4-spored. Spores 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, 43–50 $\times$ 16–18 μ.

Hosts: *Rhus crenata* Thun., Verulam, Natal, 3.7.13, Pole Evans [6804]; Mayville, Natal, 22.7.15, Medley Wood [9032].

Rhus Guienzii Sond., East London, 19.7.19, Doidge [12428].

Rhus longispina E. and Z., Despatch, near Uitenhage, 24.3.11, Doidge [1239]; Langholm Estates, Bathurst District, 14.7.19, Doidge [12348]; Kowie, Cape Province, 15.7.19, Doidge [12360]; Port Alfred, 26.9.19, Britten [14216]; Kowie River Bush, Cape Province, 30.9.19 Britten [14217].

Rhus refracta E. and Z., Langholm Estates, Bathurst District, 14.7.19, Doidge [12371]; Kowie, Cape Province, 9.11.19, Britten [14220]; Van Stadens Pass, Cape Province, 19.5.23 Doidge [17250].

Rhus villosa Linn. fil., Stella Bush, Durban, 2.7.12, Doidge [2519]; Buccleuch, near Cramond, Natal, 17.7.18, Doidge [11590]; Umkomaas, Natal, 25.4.19, Bottomley [11892].

No. 2519 on *Rhus villosa* was described as var. *tenuis*, but this cannot be separated from the species, which is very variable in habit.

36. **Meliola microthecia** Thuem.

Flora 1876, p. 569: Gaill., Le Genre Meliola, p. 73, Trans. Roy. Soc. South Africa 5, p. 734, Pl. 64, Fig. 32 (1917).

Syn. *Meliola thuemeniana* Stevens, Ann. Myc. 26, pp. 259 and 295 (1928).

Group number 3111. 4232.

Amphigenous, forming very small thin colonies ·5 to 1·5 mm. diameter. Mycelium radiating, dark brown. Hyphae undulating, 7–8 μ thick, cells 15–20 μ long, branches alternate. Capitate hyphopodia alternate, usually one to each cell, stipitate, 20–30 $\times$ 10–18 μ: stipe cell cylindrical, 6–10 μ long: head cell more or less lobed, frequently triangular with truncated angles, usually rounded or truncate at the apex. Mucronate hyphopodia on separate branches, usually opposite, inflated in the middle and drawn out into a short neck, 12–18 $\times$ 8–10 μ. Mycelial setae not very numerous, grouped round the perithecia, simple, straight, more or less translucent throughout, 200–350 μ long, 8–10 μ thick and dark brown at the base, and tapering somewhat to the paler, acute apex. Perithecia in small groups in the centre of the colonies, black, globose, verrucose, 200–250 μ diameter, superficial cells conical. Asci 3–4-spored, ovate, briefly pedicellate. Spores brown, 4-septate, ellipsoid, cylindrical, rounded at both ends, slightly constricted, 40–50 $\times$ 16–20 μ.

Host: *Barosma scoparia* E. and Z., near Grahamstown, July 1876 (MacOwan 1260 = de Thuemen's "Mycotheca Universalis," No. 851) [20798 and 21960]; Dohne Peak, 20.5.98, Galpin [21001]; Grahamstown, June 1925, Dyer [21000].

The above description is taken from Thuemen's "Mycotheca Universalis," No. 851. It is evident therefore that the type specimen of *M. microthecia* is a *Meliola*, as stated by Gaillard, and that Thuemen's description of hyaline spores is either incorrect or refers to an immature specimen. As the type specimen has been correctly named, we prefer to accept Thuemen's original nomenclature.

37. **Meliola sinuosa** Doidge.

Trans. Roy. Soc. South Africa 5, p. 735, Pl. 64, Fig. 33 (1917); Stevens, Ann. Myc. 26, p. 283 (1928).

Group number 3111. 5232.

Amphigenous, mostly hypophyllous, forming black velvety colonies 1–5 mm. diameter. Hyphae brown, sinuous, very variable in thickness, and sometimes constricted at the septa, 5–11 μ thick; branches usually opposite and emerging at right angles to the hypha; cells varying in length from 18–44 μ. Capitate hyphopodia alternate or unilateral, very irregularly placed, stipitate, straight or curved, 18–25 $\times$ 12–15 μ; stipe cell short, cylindrical, or slightly broader at the base; head cell 14–15 μ long, variable in form, often globose, ovate or uncinate, occasionally sub-lobed. Mucronate hyphopodia opposite or unilateral, flask or retort-shaped, paler, delicate, 14–20 $\times$ 6–7 μ, the lower part often almost hemispherical, narrowing suddenly into a slender neck, 7–8 $\times$ 2 2·5 μ, which is often inserted obliquely and may be straight or curved. Mycelial setae numerous, scattered, simple, straight, opaque throughout, 250–350 μ long, 8–10 μ thick at the base, and tapering only slightly near the acute apex. Perithecia scattered, black, globose, carbonaceous, 160–220 μ diameter, superficial cells convex. Asci elliptical to ovate, briefly pedicellate, 2-spored. Spores brown, 4-septate, cylindrical, rounded at both ends, slightly constricted, 48–55 $\times$ 15–18 μ, the middle cell being often slightly larger than the rest.

Host: *Trichilia emetica* Vahl., Lemana, Northern Transvaal, 14.8.11, Doidge [1783]; Kentani, Cape Province, 16.12.14, Pegler [8786]; Woodbush, Northern Transvaal, 17.9.23, Doidge [17771].

38. **Meliola Panici** Earle.

Muhlenbergia 1901 p. 12 Sacc. Syll. Fung. 17, p. 550; Bothalia 1, p. 74, Fig. 5 (1922); Stevens, Ann. Myc. 26, p. 261 (1928).

Syn. *Meliola substenospora* Hohn., forma *Rottboelliae* Rehm., Ann. Myc. 15, p. 192 (1917).

Group number 3111. 4223.

Amphigenous, forming minute spots about 1–1·5 mm. diameter, which often become confluent. Mycelium rather dense, branching freely and anastomosing. Hyphae 6–8 μ thick, straight; branches opposite or alternate; cells 13–20 μ long. Capitate hyphopodia alternate or unilateral, and usually forming a wide angle with the hyphae, usually one to each cell, 16–20 μ long; stipe cell usually cylindrical, 6–8 μ long; head cell broader than long, irregular in shape, usually 3–4-lobed or uncinate, usually truncate or rounded at the apex. Mucronate hyphopodia on separate branches, paler, opposite, inserted at right angles, broadly ampulliform, with a short thick neck, 12–15 μ long. Mycelial setae simple, straight, fairly numerous, 400–600 μ long, 8–10 μ thick and almost opaque at the base, tapering gradually towards the blunt apex, which is more translucent. Perithecia scattered, black, globose, verrucose, 160–200 μ diameter; superficial cells convex or conical. Asci 3–4-spored, evanescent. Spores cylindrical, 1-septate, slightly constricted, rounded both ends, 40–45 $\times$ 12–15 μ.

Host: *Stipa dregeana* Steud., var. *elongata*, Langholm Estates, Bathurst, 14.7.19, Doidge [12358]; Alexandria, 10.7.27, Doidge [22345].

39. **Meliola Carissae** Doidge.

Bothalia 1. p. 72 Fig. 1 (1922); Stevens, Ann. Myc. 26, p. 260 (1928).

Group number 3111. 4223.

Amphigenous, forming irregular black spots 5–6 mm. diameter, or becoming confluent and covering larger areas. Mycelium forming an irregular network. Hyphae fuscous, straight or slightly undulating, 6–8 μ thick, not infrequently constricted at the septa; branches opposite, forming an acute angle (about 45 degrees) with the hypha: cells 20–30 μ long. Capitate hyphopodia alternate or unilateral, usually one to each cell but rather irregular, 18–30 μ long: stipe cell 4–10 μ long, usually distinctly attenuate towards the base: head cell very variable in form, narrow-ovate, cuneate or sub-lobed, mostly truncate at the apex, less frequently rounded or retuse, 8–15 μ broad. Mucronate hyphopodia not very numerous, unilateral or alternate, ampulliform, with a short thick neck, 18–20 × 6–7 μ. Mycelial setae fairly numerous, simple, straight, 550–700 μ long, opaque and 9–10 μ thick at the base, and tapering very gradually to the blunt apex, which is somewhat translucent. Perithecia not very numerous, scattered, black, globose, minutely verrucose, 150–200 μ diameter: surface cells small, convex. Asci 2-spored, evanescent. Spores oblong-cylindrical, slightly constricted, rounded at both ends, brown, 43–47 × 16–20 μ; the central cell is often slightly larger than the rest.

Host: *Carissa arduina* Lam., Kentani, Cape Province, 6.9.15, Pegler [9129]; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10870]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12296]; Langholm Estates, Bathurst, 14.7.19, Doidge [12341]; Kowie, Cape Province, 15.7.19, Doidge [12361]; East London, Cape Province, 19.7.19, Doidge [12408]; Stella Bush, Durban, 11.3.21, Schilz [14702]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17189].

40. **Meliola Loxostylidis** Doidge.

Trans. Roy. Soc. South Africa 8, p. 114, Pl. 6, Fig. 6 (1920): Stevens, Ann. Myc. 26, p. 279 (1928).

Group number 3111. 4231.

Hypophyllous, forming black spots 3–4 mm. diameter. Hyphae brown, tortuous, of uneven thickness, 5–9 μ thick: cells very variable in length: branches irregular, anastomosing. Capitate hyphopodia alternate or often unilateral, stipitate, 20–30 × 10–17 μ: stipe cell cylindrical, straight or curved, 5–15 μ long: head cell ovate, uncinate or triangular, sometimes sub-lobed, rounded or truncate at the apex. Mucronate hyphopodia not numerous, opposite, alternate or unilateral, pyriform, 13–17 × 6–7 μ. Mycelial setae not very numerous, simple, straight, 140–240 μ long, pellucid throughout, not attenuated, apex blunt, 6–7 μ thick. Perithecia scattered, black, globose, verrucose, 200–240 μ diameter; superficial cells rounded or conical. Asci 2–4-spored, evanescent. Spores 4-septate, cylindrical, slightly constricted, rounded at both ends, 37–47 × 17–20 μ.

Host: *Loxostylis alata* Spreng., Paddock, Natal, 23.12.13, van der Bijl [8376]; Van Stadens Pass, 13.11.17, Doidge [10921]; Howieson's Poort, Grahamstown, 17.11.17, Doidge [10970].

41. **Meliola Cryptocaryae** Doidge.

Trans. Roy. Soc. South Africa 8, p. 112, Pl. v, Fig. 2 (1920); Stevens, Ann. Myc. 26, p. 284 (1928).

Syn. *Meliola celtidicola* van der Bijl, South African Journ. Sci. 23, p. 283 (1926).

Group number 3111. 5343.

Hypophyllous, forming round or irregular, rather thin, dull greyish-black spots, 4–10 μ diameter, often confluent and covering a large part of the leaf surface. Mycelium fairly well developed. Hyphae brown, undulating, irregularly tortuous or torulose, of irregular thickness (6–10 μ): branches opposite or irregular; cells 20–50 μ long. Capitate hyphopodia alternate, usually one to each cell, 25–35 μ long, briefly stipitate; stipe cell

cylindrical, 6–10 μ long; head cell very irregular in form, curved, hooked or sub-lobed, 10–20 μ broad, rounded, truncate or retuse at the apex. Mucronate hyphopodia paler, opposite, usually on separate short branches, ampulliform, with a short curved neck, 15–25 × 7–8 μ. Mycelial setae not numerous, except in the neighbourhood of the perithecia, straight, or more or less flexuous, simple, 400–500 μ long, less frequently up to 800 μ long, opaque and 7–10 μ thick at the base, and gradually attenuated to the blunt apex, which is more or less pellucid and 3 μ thick. Perithecia in small groups or scattered, black, globose, 240–320 μ diameter: superficial cells convex. Asci 2-spored, evanescent. Spores 4-septate, cylindrical, tapering slightly towards the rounded ends, slightly constricted, 50–60 × 18–22 μ.

Hosts: *Cryptocarya latifolia* Sond., Umbilo, Durban, 29.10.16, van der Bijl [11016]; Stella Bush, Durban, 4.8.17, van der Bijl [11352].

Cryptocarya transvaalensis Burtt Davy, Haenertsburg, Northern Transvaal, 14.9.23, Doidge [17775].

Cryptocarya Woodii Engl., Mayville, Natal, 22.7.15, Medley Wood [9025]; Zwartkop, near Pietermaritzburg, 19.7.18, Doidge [11603]; East London, 19.7.19, Doidge [12410]; Winters Kloof, Natal, 13.9.19, Doidge [12442]; Table Mountain, near Pietermaritzburg, 12.7.21, Doidge [14949].

Cryptocarya sp., Durban, Natal, van der Bijl (van der Bijl 910) [23371].

Van der Bijl 910 (the type specimen of *M. celtidicola*) is indistinguishable from *M. Cryptocaryae*, and, moreover, the host is not *Celtis Soyauxii* but *Cryptocarya* sp. It is possibly *Cryptocarya myrtifolia*, but the material is too scanty for specific diagnosis.

42. **Meliola torta** Doidge.

Trans. Roy. Soc. South Africa 5, p. 726, Pl. 60, Fig. 16 (1917). Ibid. 7, p. 193, Fig. 1 (1919.) Stevens, Ann. Myc. 26, p. 283 (1928).

Group number 3111. 6343.

Amphigenous, forming thin black colonies, 5–10 mm. diameter. Hyphae forming an irregular network, brown, slender, undulating, 5–7 μ thick; branching irregular; cells 25–40 μ long. Capitate hyphopodia alternate or unilateral, distant, slender, 25–40 μ long; rarely up to 60 μ long; stipe cell varying in form and size, sub-cylindrical but usually tapering towards the base, and more or less bent or curved, less frequently straight, occasionally 1–2-septate, 10–20 μ long or even up to 40 μ long; head cell very variable in form and size, mostly 14–25 μ long and 14–20 μ broad, usually variously lobed and often hooked or twisted, rounded or truncate at the apex. Mucronate hyphopodia rather numerous, interspersed with the capitate hyphopodia, opposite or unilateral 1-celled or occasionally 2-celled, slender ampulliform with a long neck, 20–36 × 6–7 μ. Mycelial setae not numerous except near the perithecia, simple, straight or sub-falcate, 300–600 μ long, 10–11 μ thick at the base and tapering very gradually to a blunt apex which is not more than 3 μ thick, opaque except near the apex. Perithecia few and scattered, black, globose, 250–400 μ diameter; superficial cells very large, projecting, mammillate. Asci 2-spored. Spores ellipsoid, 4-septate constricted, rounded at the ends, the central cell being distinctly larger than the lateral ones 54–67 × 20–22 μ.

Host: *Trichocladus crinitus* Pers., Izelini Forest, Kingwilliamstown, 14.6.15, Emmett [9064]; Woodville Forest, George, 11.11.17, Doidge [10939]; Izelini Forest, Kingwilliamstown, 22.6.18, [11610]; Storms River, Humansdorp District, 15.5.23, Doidge [17170]; Deepwalls, Knysna District, 13.5.23, Doidge [17195].

Nearly always associated with *Irene scabra* on the same leaves.

43. **Meliola Doidgeae** Syd. n. sp.

Trans. Roy. Soc. South Africa 5, p. 733 (1917), sub. *M. amphitricha*.

Group number 3111. 4222.

Amphigenous, colonies more numerous on the upper surface, velvety black, round, up to 4 mm. diameter, often confluent. Mycelium compact, radiating. Hyphae almost

straight, fuscous, 7–9 μ thick; cells 10–20 μ long; branches opposite, often emerging at a wide angle (slightly less than a right angle). Capitate hyphopodia alternate (rarely opposite), usually one to each cell, 15–20 × 8–10 μ, stipe cell short, cylindrical, head cell cylindrical or ovate. Mucronate hyphopodia on separate branches, opposite, fairly numerous, 10–20 × 6–8 μ, ampulliform, with a very short, oblique or curved neck. Mycelial setae fairly numerous, 240–360 μ long, simple, straight, apex usually acute but sometimes blunt, somewhat translucent throughout, 6–7 μ thick at the base. Perithecia black, globose verrucose, carbonaceous, 160–200 μ diameter, superficial cells conical. Asci 2-spored, evanescent. Spores cylindrical, slightly constricted, rounded at both ends, 35–43 × 10–13·5 μ, cells often somewhat unequal in size.

Host: *Sapindus oblongifolius* Sond., Stella Bush, Durban, 11.7.11, Doidge [1572]; Stella Bush, 2.7.12, Doidge [2520]; Durban, July 1917, Franks [8404]; Stella Bush, 1.7.14, Franks [9504]; Umkomaas, Natal, 20.4.19, Bottomley [11896]; Bluff, Durban, 11.3.21, Schilz [14703].

44. **Meliola oleicola** Doidge.

Bothalia 1, p. 73, Fig. 4 (1922). Stevens, Ann. Myc. 26, p. 276 (1928).
Group number 3111. 4332.

Amphigenous, forming round, dull black spots, 2–4 mm. or becoming confluent and covering large areas of the leaf surface. Mycelium olivaceous, freely branched and interwoven: branches opposite, emerging at an acute angle (about 45°): cells 16–25 μ long; Capitate hyphopodia alternate, usually one to each cell, 26–30 μ long; stipe cell short, cylindrical; head cell ovate or sub-cylindrical, straight or somewhat curved, 18–20 × 10 μ; closely appressed to or forming an acute angle with the hypha. Mucronate hyphopodia on separate branches, opposite alternate or unilateral, slender ampulliform, base not much wider than the curved neck, 20–23 × 6–7 μ. Mycelial setae numerous, scattered, simple, straight or flexuous, 240–300 μ long, 9–10 μ thick at the base, and tapering somewhat towards the apex which is acute or sub-acute: when mature, opaque right to the apex. Perithecia not very numerous, black, globose, 220–250 μ diameter, verrucose, surface cells convex. Asci 2 to 4-spored, early evanescent. Spores oblong 4-septate, very slightly constricted, broadly rounded at both ends, chestnut brown, 45–50 × 20–23 μ.

Hosts: *Olea capensis* L., Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12331 and 12332]; Storms River, Humansdorp District, 15.5.23, Doidge [17232].

Olea foveolata E. Mey., Langholm Estates, Bathurst, 14.7.19, Doidge [12351]: Kowie, Cape Province, 15.7.19, Doidge [12364]: Kowie River Bush, 30.9.19, Britten [14218].

Olea laurifolia Lam., Woodbush, Northern Transvaal, 4.8.11, Doidge [1767 and 1835]; Tabankulu, Pondoland, 4.4.15, [9103]: Woodville Forest, George, 11.11.17, Doidge [10937]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10967]: Buccleuch, Natal, 17.7.18, Doidge [11557]; Assegai Bush, Humansdorp District, 16.5.23, Doidge [17236].

Olea Pegleri C. H. Wright, Kentani, Cape Province, 29.8.14 and 16.12.14, Pegler [8382 and 8785].

45. **Meliola polytricha** Kalch. et Cke.

Grevillea, p. 72 (1880); Gaill., Le Genre Meliola, p. 92, Trans. Roy. Soc. South Africa 5, p. 735 (1917), Pl. 65, Fig. 34. Stevens, Ann. Myc. 26, p. 274 (1928).
Group number 3111. 5322.

Amphigenous, mostly hyphophyllous, forming round, velvety black colonies 2–3 mm. diameter rarely up to 5 mm. diameter. Mycelium dense and closely compact, olivaceous brown: hyphae radiating, much-branched, almost straight, 8–10 μ thick: cells mostly 16–22 μ long: branches opposite or alternate, emerging at an acute angle with the hyphae, and later through compression running almost parallel with them. Capitate hyphopodia alternate, usually one to each cell, closely appressed to the hyphae, stipitate, 20–25 μ long; stipe cell short, cylindrical; head cell broadly ovate or globose, 14–16 μ long and 12–14 μ

broad, sometimes flattened by contact. Mucronate hyphopodia not very numerous on separate short branches, opposite ampulliform or pyriform with a rather thick neck, 10–18 × 6–8 μ. Mycelial setae numerous, simple, straight or somewhat flexuous, 250–350 μ long, 8–10 μ thick at the base and tapering only slightly, opaque right up to the acute apex. Perithecia numerous, scattered, black, globose, minutely verrucose, 160–200 μ diameter; superficial cells small, slightly convex or conical. Asci 2-spored, evanescent. Spores brown, 4-septate, cylindrical, rounded at both ends, constricted, 50–57 × 16–22 μ.

Host: *Pittosporum viridiflorum* Sim, Inanda, Natal, Medley Wood 222 [10358]; Claridge, Natal, 31.5.15, Doidge [8996]; Claridge 15.7.21, Doidge [14945].

There seems to be considerable confusion with regard to the identity of this species. It was described in Grevillea VIII, p. 72 (1880) as follows:—

"*Meliola polytricha* Kalch. et Cke. in Herb. Kalch. Hypophylla vel amphigena, atra maculaeformis. Mycelio effuso, radiato conidiifero. Conceptaculis globosis; appendiculis erectis, simplicibus, acutis, plerumque flexuosis. Sporangiis ovatis. Sporidiis cylindricis, obtusis, 4-septatis, constrictis atrobrunneis. Conidiis clavatis, 3–5 septatis (·05 × ·008 mm.) in hyphis erectis flexuosis gerentibus.

On leaves. (Wood) No. 222.

Conceptacles about one-fifth of a millimetre in diameter. The conidia greatly resemble some species of *Helminthosporium*."

Medley Wood's No. 222 is therefore the type, and a part of the type collection is in the National Herbarium. By careful comparison of the host and fungus with later collections there can be no doubt whatsoever that the host is *Pittosporum viridiflorum*.

In Grevillea IX, p. 34 (1880), two collections of MacOwan's are assigned to this species, namely, No. 1256 on *Osyris compressa* and No. 1262 on *Cunonia capensis*.

Part of MacOwan's material of these two numbers has been examined and it is evident that neither is identical with Wood's No. 222. Both differ in habit: No. 1262 has lobed hyphopodia, and 1256 has more slender hyphopodia than *M. polytricha* and tapering setae with a blunt tip. The dimensions of the spores are also different. Gaillard (Le Genre Meliola, p. 92) does not mention the type specimen, but quotes the two latter: he also adds two other hosts one of which is *Schinus molle* and gives a description which does not apply to the type: differing in almost every particular. The above description is taken from the type specimen.

46. **Meliola Psychotriae** Earle.

Bull. New York Bot. Gard. 3, p. 308 (1905). Stevens, Ann. Myc. 26, p. 246 (1928).

Syn. *Meliola microspora* Pat. et. Gaill., Bull. Soc. Myc. 1888, p. 104 Gaill., Le Genre Meliola, p. 75. var. *africana* Doidge, Trans Roy. Soc. South Africa 5, p. 732, Pl. 63, Fig. 29 (1917).

Group number. 3111. 3222.

Amphigenous, forming very minute black colonies 0·5–1 mm. in diameter. Hyphae slender, radiating, 5–8 μ thick, cells 20–35 μ long; branches few, opposite or alternate. Capitate hyphopodia alternate or unilateral, usually one to each cell, stipitate, broadening gradually from the base to just below the rounded apex 16–22 × 7–8 μ; head cell ovate or sub-globose 14–16 μ long. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite, slender ampulliform, 15–20 × 6–7 μ. Mycelial setae, not very numerous, mostly grouped round the perithecia, simple, straight or somewhat flexuous, 230–320 μ long, 6–8 μ thick at the base and tapering to the blunt apex, translucent throughout, but dark brown at the base and paler at the apex, often sub-torulose. Perithecia few, in a small group in the centre of the colony, black, globose, verrucose, 150–180 μ diameter; superficial cells convex or conical. Asci ovate, briefly pedicellate, 3–4 spored. Spores 4-septate, cylindrical, broadly rounded at both ends, very slightly constricted, 23–33 × 10·5–15 μ, frequently broader at one end than the other.

Hosts: *Plectranthus ciliatus* E. Mey., Grahamstown, June 1876, MacOwan 1259 [20799]. (This specimen is labelled *M. capnodioides*, and is included by Gaillard under *M. amphitricha*.)

Labiatae undet. (? *Plectranthus*, ? *Stachys*), Inanda, Medley Wood [10350 and 10353]; Buccleuch, Natal, 17.7.18, Doidge [11576]; Woodbush, Northern Transvaal, 4.8.11, Doidge [1766], Woodbush 18.9.23, Doidge [17768].

Galopina circaeoides Thun., Woodbush, 3.8.11 and 18.9.23, Doidge [1760 and 17752]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12323].

Barleria obtusa Nees., Amanzimtoti, 20.5.13, Doidge [6623].

Hypoestes verticillaris R. Br., Woodbush, 18.9.23, Doidge [17749].

Isoglossa Woodii C. B. Cl., Stella Bush, Durban, 4.8.17, van der Bijl [11351], same locality 7.4.18, Bottomley [11377].

Rhinacanthus communis Nees., Town Bush Valley, Pietermaritzburg, 21.3.16, Doidge [9721].

47. **Meliola Popowiae** Doidge.

Trans. Roy. Soc. 8, p. 142, Pl. 8, Fig. 8 (1920); Stevens, Ann. Myc. 26, p. 242 (1928).

Group number 3111. 3222.

Epiphyllous, effuse, forming thin black pellicles. Hyphae sparse, brown, undulating, uneven, 6–7 μ thick, cells varying from 10–30 μ in length, branches opposite or irregular. Capitate hyphopodia unilateral or alternate, occurring very irregularly, usually at right angles to the hypha, stipitate, 12–15 × 8–10 μ; stipe cell short, cylindrical; head cell globose. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or scattered, slender ampulliform, straight or curved, 15–20 × 5–7 μ. Mycelial setae scarce, mostly developed round the perithecia, simple, straight or slightly flexuous, 300–500 μ long, opaque and 10 μ thick at the base, slightly attenuated towards the blunt apex, which is 6–7 μ thick and slightly translucent. Perithecia few, globose, black, carbonaceous, verrucose, 180–200 μ diameter; superficial cells convex or conical. Asci evanescent. Spores 4-septate, cylindrical, constricted, rounded at both ends, 35–40 × 13–16 μ.

Host: *Popowia caffra* Hook. fil., Kentani, Cape Province, 1.3.15, Pegler [8882]; Winters Kloof, Natal, 1.6.15, Doidge [8990]; Buccleuch, Natal, 17.7.18, Doidge [11587]; Hilton Road, Natal, 21.7.18, Doidge [11607]; Winters Kloof, Natal, 13.9.19, Doidge [12435].

This is a very inconspicuous species, and it is usually badly parasitised.

48. **Meliola dactylipoda** Syd. n. sp.

Group number 3111. 4222.

Epiphyllous, forming rather thin, dull black, round to irregular spots up to 5 mm. diameter. Mycelium not dense, reticulate, composed of fuscous hyphae, which are straight or slightly undulating, 7–10 μ thick; cells 25–30 μ long; branches opposite, usually diverging almost at right angles to the hypha. Capitate hyphopodia alternate, usually one to each cell, 27–37 μ long, 8–10 μ thick, cylindrical, straight or slightly undulating, rounded at the apex; stipe cell 5–10 μ long. Mucronate hyphopodia fairly numerous, interspersed with the capitate hyphopodia, opposite, ampulliform, with a short curved neck, 13–20 × 6–8 μ. Mycelial setae not numerous, mostly in the neighbourhood of the perithecia, simple, straight, 300–500 μ long, opaque and 7–10 μ thick at the base, tapering gradually to the blunt apex, which is more or less translucent. Perithecia scattered, black, globose, about 200 μ diameter (only a few mature); superficial cells strongly convex. Asci not seen. Spores brown, 4-septate, oblong, broadly rounded at both ends, very slightly constricted, 36–43 × 16–18 μ.

Hosts: *Cryptocarya Woodii* Engl., Duncairn, near Pietermaritzburg, 13721, Doidge [14953].

Cryptocarya liebertiana Engl., Inyanza, Rhodesia, August 1920, Eyles [15518].

Differs from *M. Cryptocaryae* in the size of its spores and the form of its hyphopodia.

49. **Meliola cylindripoda** Doidge.

Trans. Roy. Soc. South Africa 8, p. 138, Pl. 7, Fig. 2 (1920): Stevens, Ann. Myc. 26, p. 279 (1928).

Group number 3111. 4232.

Amphigenous, usually hypophyllous, forming thin black pellicles 3–6 mm. diameter, often more or less confluent. Mycelium forming an open network. Hyphae fuscous, 6–7 μ thick, somewhat undulating; branches opposite; cells 20–27 μ long. Capitate hyphopodia, alternate or unilateral, usually one to each cell, 12–16 × 6–9 μ; stipe cell very short, cylindrical; head cell cylindrical or sub-ovate. Mucronate hyphopodia few, opposite or scattered, ampulliform or pyriform, 16 × 6–7 μ. Mycelial setae not numerous except near the perithecia, simple, straight, or more or less flexuous, 300–500 μ long, 6–7 μ thick at the base, and tapering gradually to the tip, which is blunt and 1·5–3 μ thick, opaque at the base, more translucent near the apex. Perithecia globose, black, scattered, minutely verrucose, 200–240 μ diameter; superficial cells slightly convex. Asci evanescent. Spores dark brown, cylindrical, 4-septate, rounded at both ends, slightly constricted, 40–44 × 15–17 μ.

Host: *Eugenia* sp. (near *Eu. Zeyheri*), Zwartkop, near Pietermaritzburg, 19.7.18, Doidge [11596], Zwartkop 6.9.19, Doidge [12437]; Karkloof, near Pietermaritzburg, 14.7.21, Doidge [14943].

50. **Meliola Knowltoniae** Doidge.

Bothalia 1, p. 208, Fig. 6 (1924); Stevens, Ann. Myc. 26, p. 260 (1928).

Group number 3111. 3222.

Epiphyllous, forming rather thin black carbonaceous spots up to 5 mm. diameter; mycelium consisting of brown, rather sinuous hyphae, 9–11 μ thick (usually 10 μ); cells mostly 35–40 μ long; branches opposite. Capitate hyphopodia alternate, usually one to each cell, stipitate, 27–34 × 13·5–17 μ, the majority at an angle of about 45° with the hypha, but sometimes more widely divergent; stipe cell cylindrical, 6·5–10 μ long; head cell clavate, sub-lobed or subuncinate, in- or recurved, but usually the latter. Mucronate hyphopodia fairly numerous near the centre of the colony, opposite, not paler than the capitate hyphopodia, 16–17 × 8–10 μ, ampulliform with rather a short neck, 3·5 μ thick. Mycelial setae most numerous in the neighbourhood of the perithecia, straight or somewhat flexuous, 400–500 μ long, 10 μ thick at the base, the majority tapering gradually to the blunt and somewhat less opaque apex, which is 2–3 μ thick; a few of the setae are less tapering, and have a blunt apex up to 5 μ thick. Perithecia in groups in the centre of the colony, black, globose, carbonaceous, slightly rough, 160–200 μ diameter. Asci 2-spored, evanescent. Spores 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, brown, 42–46 × 16·5–20 μ.

Host: *Knowltonia vesicatoria* Sims., Storms River, Humansdorp Dist., 15.5.23, Doidge [17177].

51. **Meliola Goniomae** Doidge comb. nov.

Syn. *Amazonia Goniomae* Doidge, Bothalia 1, p. 204 (1924); Stevens, Ann Myc. 25, p. 414 (1927).

Group number 3111. 4232.

Amphigenous, forming irregular circular dull black spots up to 7 mm. diameter. Hyphae olivaceous, brown, undulating, 6–8 μ thick; cells 20–27 μ long; branches usually opposite, less frequently unilateral. Capitate hyphopodia alternate or unilateral, stipitate, usually one to each cell, straight or curved, 20–27 × 8·6–10 μ; stipe cell short, cylindrical head cell cylindrical or ovate, often curved. Mucronate hyphopodia very numerous in some colonies on separate branches, or mixed with the capitate hyphopodia opposite, curved, slender ampulliform, with a short rather thick neck 12–15 × 5–7 μ. Mycelial setae usually present in colonies with mature perithecia, simple, straight, or more or less flexuous, somewhat

translucent throughout, apex blunt, 300–400 μ long, 6–7 μ thick at the base. Perithecia at first radiating in structure, formed of radiating hyphae about 6 μ thick, later becoming globose, black, verrucose, 200–220 μ diameter, superficial cells rounded or conical. Asci 2-spored, evanescent. Spores 4-septate, flattened cylindrical, brown, broadly rounded at both ends, slightly constricted, 40–47 × 15–16·5 × 10–12 μ.

Host: *Gonioma Kamassi* E. Mey., Van Stadens Pass, 9.3.16, Bottomley [9561]; Woodville Forest, George, 11.11.17, Doidge [10938]; Keurkloof Forest, George, 9.5.23, Doidge [17109]; Deepwalls, Knysna, 13.5.23, Doidge [17209]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17230]; Assegai Bush, Humansdorp Dist., 16.5.23, Doidge [17235].

This species seems to vary in the different collections. The mycelium and hyphopodia are identical in all, but in some there are no mycelial setae and the young perithecia are decidedly radiating in structure. It would appear that the perithecia long remain dimidiate, but in most cases swell and become spherical at maturity: this species may be regarded as a transition form between *Amazonia* and *Meliola*, but is more properly included in the genus *Meliola* as in the mature perithecia are typically spherical.

52. **Meliola Osyridis** Doidge n. sp.

Group number 3111. 4232.

Amphigenous, but mostly hypophyllous, forming round, black colonies up to 3 mm. diameter, often becoming confluent and forming larger black areas of irregular outline. Mycelium brown, radiating; hyphae almost straight, or gently undulating 6–8 μ thick; cells 10–20 μ long, branches usually opposite. Capitate hyphopodia stipitate, alternate or unilateral, usually one to each cell, 20–30 × 7–10 μ; stipe short, tapering somewhat to the base, head cell ovate or cylindrical. Mucronate hyphopodia rather numerous, on separate branches, opposite, ampulliform with a short, rather thick curved neck, 15–17 × 6–10 μ. Mycelial setae fairly numerous, simple, straight or slightly flexuous, 240–340 μ long, 7–8 μ thick and opaque at the base, tapering gradually to the blunt apex which is usually somewhat translucent. Perithecia grouped in the centre of the colony, black, globose, minutely verrucose, 200–250 μ diameter, superficial cells rather small convex or conical. Asci 2-spored evanescent. Spores cylindrical, brown, 4-septate, broadly rounded at both ends, very slightly constricted, 43–47 × 17–20 μ.

Hosts: *Osyris compressa* A.DC., near Grahamstown, June 1876, MacOwan 1256 [20771]; Natal, Medley Wood 448 [10359]; Grahamstown, 15.11.17, Doidge [10954], same locality June 1919, Britten [12187].

Rhoicarpus capensis A.DC., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10866]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10963]; Langholm Estates, Bathurst District, 14.7.19, Doidge [12349]; Howiesons Poort, 12.7.19, Doidge [12374]; Van Stadens Pass, 19.5.23, Doidge [17253].

53. **Meliola littoralis** Syd. n. sp.

Sub. *Meliola amphitricha* Fr. in Trans. Roy. Soc. South Africa 5, p. 733, 1917.

Group number 3111. 4233.

Amphigenous, but mostly epiphyllous; colonies rather thin, black, sub-circular, 2–5 mm. diameter, or becoming irregular and larger by confluence. Mycelium arachnoid; hyphae brown, straight or somewhat sinuous, 7–8 μ thick, cells variable in length, 20–40 μ; branches opposite, emerging at an acute angle with the main hyphae. Capitate hyphopodia alternate or unilateral, usually one to each cell, stipitate, 23–30 μ long; stipe cell 7–10 μ long, sub-cylindrical, or narrowing towards the hyphae; head cell ovoid or sub-cylindrical, 10–12 μ thick. Mucronate hyphopodia rather numerous, opposite, alternate or unilateral, on separate hyphae which are rather more slender than those bearing the capitate hyphopodia, ampulliform with a rather short, thick neck, 13–16 μ long. Mycelial setae rather numerous, scattered, but more numerous in the vicinity of the perithecia, 300–640 μ long, opaque, black and 8–10 μ thick at the base, tapering gradually towards the more translucent, blunt

apex. Perithecia fairly numerous, scattered black, carbonaceous, globose, 190–240 μ diameter, surface cells convex. Asci ellipsoid 2–4-spored. Spores brown, 4-septate, cylindrical, slightly constricted, broadly rounded at both ends, 40–45 × 17–20 μ.

Hosts: *Burchellia capensis* R. Br., Inanda, Natal, August 1881, Medley Wood 653 [9502 and 10352].

Gardenia globosa Hochst., Kentani, Cape Province, 1.4.12, Pegler [2214]: Winkle Spruit, 28.5.15, Doidge [9013 and 9014]: Umgeni, 16.7.15, Medley Wood [9038].

Gardenia Rothmannia Linn. fil., Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11830]; Umkomaas, Natal, 25.4.19, Bottomley [11895].

Grumilea capensis Sond., Louis Trichardt, 8.4.19, Putterill [11826]; Umkomaas, 24.5.19, Bottomley [11891].

Grumilea cymosa E. Mey., Amanzimtoti, 10.7.11, Doidge [1575]; Stella Bush, Durban, 2.7.12, Doidge [2521].

Grumilea globosa Hochst., Kentani, Cape Province, 29.5.12, Pegler [2366].

Keetia transvaalensis Phillips, Buccleuch, Natal, 17.7.18, Doidge [11575].

Pavetta Bowkeri **Harv., Krantzkloof, 14.8.14, Van der Bijl [8377].**

Plectronia ciliata Dietr., Grahamstown, June 1919, Britten [12188]; Hogg's Back, 15.1.18, Henderson [11346]; Pirie Forest 6.7.27, Doidge [22459].

Plectronia spinosa Klotzsch., Howiesons Poort, Grahamstown, 17.11.17, Doidge [10965].

Plectronia spp., Grahamstown, 17.9.19, Britten [14224]; Keurkloof Forest, George, 9.5.23, Doidge [17108]; Storms River, Humansdorp District, 15.5.23, Doidge [17178]; Deepwalls, Knysna, 13.5.23, Doidge [17196]; Van Stadens Pass, 19.5.23, Doidge [17255].

LATIN DESCRIPTION OF NEW SPECIES.

Irene Nuxiae Syd. nov. spec.

Plagulae amphigenae, in epiphyllo plerumque magis numerosae, laxe vel dense sparsae, ambitu orbiculares, saepe angulatae vel irregulares, 2–4 mm. diam. haud raro confluentes et tunc majores: mycelium ex hyphis opposite ramosis, plerumque rectis vel leniter undulatis olivaceo-brunneis, 5–8 μ crassis, septatis (articulis 15–30 μ longis) compositum. Hyphopodia capitata alternantia vel unilateralia, 16–20 μ longa, semper integra, cellula basali cylindracea vel cylindraceo-conoidea, 3–8 μ longa et 5–7 μ lata cellula apicali late rotundata vel rarius truncata, globosa vel ovoidea, 11–16 μ longa et 9–11 μ lata. Hyphopodia mucronata sat numerosa opposita, praecipue in medio plagularum evoluta, lageniformia, 15–18 μ longa, basi 6–8 μ lata. Perithecia sparsa, globosa, atra, 180–220 μ diam. astoma, cellulis parietis irregularibus protruberantibus, mammillatis, 15–30 μ diam. Asci ovati, breviter pedicellati, bispori. Sporae 4-septatae, brunneae, cylindraceae, utrinque late rotundatae, leniter constrictae, 45–50 × 18–22 μ.

Hab. in foliis *Nuxiae floribundae*, Woodbush, Transvaal, 3.8.11, leg Doidge [1776].

Meliola Allophylli Doidge nov. spec.

Plagulae amphigenae, atrae, sparsae, plus minus orbiculares, usque 2·5 mm. diam. saepe confluentes. Mycelium ex hyphis plus minusve undulatis, alterne ramosis, septatis (articulis 15–27 μ longis), olivaceo-brunneis, 6–7 μ crassis compositum. Hyphopodia capitata alternantia, 15–25 μ longa, cellula basali breviter cylindracea, v. gibbosa, 4–10 μ longa et 6–7 μ lata, apicali irregulariter clavata, truncata v. sub-lobata, 10–17 μ longa et 6–14 μ lata. Hyphopodia mucronata haud numerosa, pallidiora, 15–20 μ longa, plus minus lageniformia, e basi ventricoso-dilatata 6–7 μ lata in collum rectum vel curvatum 3–4 μ latum attenuata. Setae myceliales sat numerosae, sparsae, rectae, pellucide atro-brunneae, 240–400 μ longae, inferne 6–7 μ crassae, apicem versus paulo attenuatae et dilutius coloratae, ad apicem simplices acutae vel bifidae, dentibus minutis vel usque 30 μ longis, acutis. Perithecia in centro plagularum laxe gregaria, atra, globosa, 120–170 μ diam. cellulis parietis leniter convexis, in sicco collapsa. Asci fugaces. Sporae 4-septatae, cylindraceae, utrinque late rotundatae, leniter constrictae, olivaceo-brunneae, 35–40 × 13–17 μ.

Hab. in foliis *Allophylli erosi*, Kowie, Cape Province, 11.8.12, leg. Britten [21009].

Meliola Azimae Doidge nov. spec.

Plagulae amphigenae et caulicolae, sed plerumque epiphyllae, sub-orbiculares, atrae, sparsae, usque 3 mm. diam. saepe confluentes. Mycelium ex hyphis fere rectis fuscis, vix torulosis, opposite ramosis, septatis (articulis 20–35 μ longis) 7–10 μ crassis compositum. Hyphopodia capitata plerumque opposita, rarius alternantia v. unilaterales, 16–24 μ longis et 6–7 μ lata, cellula basali breviter cylindracea, apicali plerumque cylindracea, ad apicem rotundata v. truncata, rarius clavata v. hamata. Hyphopodia mucronata, haud numerosa, inter hyphopodia capitata interspersa, 15–18 μ longa, ampullacea, basi 6–7 μ lata, collo brevi. Setae myceliales, simplices, rectae, atrae opacae fere usque ad apicem, 240–640 μ longae, basi 10–12 μ crassae, prope apicem acutum leniter attenuatae. Perithecia sat numerosa, in centro plagularum laxe gregaria, atra, globosa, 160–250 μ diam. cellulis parietis leniter convexis, in sicco collapsa. Asci 2–3-spori fugaces. Sporae atro-brunneae, cylindraceae utrinque rotundatae, vix constrictae, 43–50 × 16·5–20 μ.

Hab. in foliis caulibusque *Azimae tetracanthae*, East London, 23.7.27, leg. Doidge [22387].

Meliola Behniae Syd. nov. spec.

Plagulae amphigenae, atrae, facile a foliis secedentes, 2–5 mm. diam. Mycelium reticulatum ex hyphis brunneis rectis, opposite ramosis, septatis (articulis 17–20 μ longis) anastomosantibus, 7–9 μ crassis compositum. Hyphopodia capitata alternantia vel unilateralia, 17–20 μ longa : cellula basali breviter cylindracea, 5–7 μ longa : apicali subglobosa, 10–13 μ lata. Hyphopodia mucronata numerosa, alternantia v. opposita, inter hyphopodia capitata interspersa, pyriformia v. ampullacea, collo recto v. curvato, 15–20 μ longa et basi 6–7 μ lata. Setae myceliales numerosissimae, robustae, erectae, prope basim abrupte geniculatae v. curvato-acclivae, atro-brunneae, opacae, 250–350 μ longae, 10–11 μ crassae, ad apicem breviter bi- v. tri-ramosae : ramis 10–17 μ longis, et iterum ad apicem in ramulis duobus v. ternos attenuatos divisis : ramulis 6–10 μ longis, nonnunquam ad apicem bidentatis. Perithecia atra, globosa, 250–300 μ diam. Asci non visi. Sporae rectae, brunneae, cylindraceae, 4-septatae, constrictae, utrinque late rotundatae, 43–46 × 16 μ.

Hab. in foliis *Behniae reticulatae*, Louis Trichardt, Transvaal, 8.4.19, leg. Putterill [11848].

Meliola brachyodonta Syd. nov. spec.

Syn. *Meliola geniculata* Syd. et Butl. var. *macrospora* Doidge, Trans. Roy. Soc. South Africa VIII, p. 109 (1920).

Epiphylla, plagulas orbiculares vel irregulares 1–3 mm. diam. atro-griseas formans : mycelium copiose evolutum ex hyphis undulatis, 6–8 μ crassis, ramosis, septatis (articulis 16–36 μ longis), olivaceo-brunneis compositum. Hyphopodia capitata alternantia, stipitata, 16–24 μ longa : cellula basali breviter cylindracea, 5–10 μ longa et 6–8 μ crassa ; apicali ovata, obtuse rotundata, 10–14 μ lata. Hyphopodia mucronata haud numerosa, opposita vel unilateralia, usque 25 μ longa, plus minusve lageniformia e basi ventricoso-dilatata, 6–10 μ lata, subito in collum rectum vel curvatum 3–4 μ crassum attenuata. Setae myceliales sat numerosae, omnino pellucidae, brunneae, sursum sensim dilutiores, 6–8 μ crassae, 200–300 μ longae, prope basim abrupte geniculatae, ad apicem obtusum bis usque quinquies incisae quasi denticulatae (dentibus brevibus acutisque, 3–8 μ longis). Perithecia laxe gregaria, atra, globosa, 180–240 μ diametro, cellulis parietis convexis, vix prominulis. Asci bispori, ovati, brevissime pedicellati, fugaces. Sporae brunneae, 4-septatae, oblongae vel cylindraceae, utrinque rotundatae, leniter constrictae, 40–43 × 16–18 μ.

Hab. in foliis *Rhois tomentosae*, Van Stadens Pass, Cape Province, 13.11.17, leg. Doidge [10879].

Meliola buxicola Doidge nov. spec.

Plagulae amphigenae sed plerumque epiphyllae, atrae, velutinae, suborbiculares, usque 5 mm. diam. Mycelium ex hyphis brunneis, rectiusculis, opposite ramosis, septatis (articulis 13–20 μ longis) 6·5–8 μ crassis compositum. Hyphopodia capitata opposita, alternantia v. unilateralia, 15–20 μ longa v. rarius usque 24 μ longa; cellula basali breviter cylindracea; apicali sub-globosa v. rarius clavato-cylindracea, circ. 10 μ diam. Hyphopodia mucronata haud numerosa, inter hyphopodia capitata interspersa, praecipue in centro plagularum evoluta, opposita v. solitaria, 15–18 μ longa et basi 6–8 μ lata, ampullacea collo recto v. curvato. Setae myceliales numerosae, simplices rectae, 300–250 μ longae, basi 7–9 μ crassae, atro-brunneae, opacae, ad apicem obtusum pellucidem sensim attenuatae. Perithecia sat numerosa, sparsa, atra, globosa, 200–250 μ diam. in sicco collapsa, cellulis parietis convexis v. conoideis. Asci fugaces. Sporae brunneae, 4-septatae, cylindraceae v. sub-ellipsoideae, utrinque late rotundatae, leniter constrictae, 43–47 × 16·5–22 μ.

Hab. in foliis *Buxi MacOwani*, East London, 23.7.27, leg. Doidge [22388].

Meliola Cnestidis Doidge nov. spec.

Plagulae amphigenae, plus minus orbiculares v. irregulares, usque 5 mm. diam. Mycelium ex hyphis fuscis undulatis opposite ramosis, septatis (articulis 20–30 μ longis) 6–8 μ crassis compositum. Hyphopodia capitata alternantia v. unilateralia, interdum opposita, 18–20 μ longa, cellula basali plerumque cylindracea, rarius cylindraceo-conoidea, interdum septata, 5–16 μ longa; apicali 6–16 μ lata, plerumque integra, et hamata v. ante v. retro curvata, rarius recta et truncata v. sublobata. Hyphopodia mucronata haud numerosa, praecipue in centro plagularum evoluta, ampullacea, collo recto v. curvato, 16–20 μ longa et 6–7 μ lata. Setae myceliales sat numerosa, praecipue juxta perithecia evolutae, simplices, rectae, atro-brunneae, 250–350 μ longae, basi opacae et 7–8 μ latae, sursum haud vel vix attenuatae, ad apicem acutae et plus minus pellucidae. Perithecia sparsa, atra, globosa, 150–200 μ diam. minute verrucosa. Asci 2–3-spori, fugaces. Sporae oblongae, atro-brunneae, 4-septatae, vix constrictae, 42–47 × 15–17 μ.

Hab. in foliis *Cnestidis natalensis*. Kentani, Cape Province, 10.12.15, leg. Pegler [9527].

Meliola dactylipoda Syd. nov. spec.

Plagulae epiphyllae tenues, atrae, orbiculares v. irregulares usque 5 mm. diametro. Mycelium reticulatum effusum ex hyphis fuscis rectiusculis v. plus minus undulatis opposite ramosis septatis (articulis 25–30 μ longis) 7–10 μ crassis compositum. Hyphopodia capitata alternantia 27–37 μ longa, 8–10 μ lata, cylindracea recta v. sub-curvata ad apicem rotundata, cellula basali 5–10 μ longa. Hyphopodia mucronata sat numerosa, opposita ampullacea collo brevi curvato, 13–20 μ longa et basi 6–8 μ lata. Setae myceliales haud numerosae praecipue juxta perithecia evolutae, simplices, rectae, 300–500 μ longae, basi opacae et 7–10 μ crassae, sursum ad apicem obtusum pellucidum sensim attenuatae. Perithecia sparsa, atra, globosa, circ. 200 μ diam. cellulis parietis convexis. Asci non visi. Sporae brunneae, 4-septatae, oblongae, utrinque late rotundatae, vix constrictae, 39–43 × 16–18 μ.

Hab. in foliis *Cryptocaryae Woodii*, Duncairn, prope Pietermaritzburg, Natal, 13.7.21, leg. Doidge [14953].

Meliola Doidgeae Syd. nov. spec.

Plagulae amphigenae, saepius epiphyllae, atrae, velutinae, orbiculares, usque 4 mm. diam. saepe confluentes. Mycelium compactum ex hyphis rectiusculis, fuscis, opposite ramosis, septatis (articulis 10–20 μ longis) 7–9 μ crassis compositum. Hyphopodia capitata alternantia raro opposita, 15–20 μ longa, cellula basali breviter cylindracea, apicali cylindracea vel ovata, 6–8 μ lata. Hyphopodia mucronata sat numerosa, praecipue in centro plagularum evoluta, ampullacea collo brevi obliquo v. curvato, 10–20 μ longa, basi 6–8 μ lata. Setae myceliales sat numerosae, simplices rectae, 240–360 μ longae, per totam longitudinem plus

minus pellucidae, basi 6-7 μ crassae, apice plerumque acutae sed nonnunquam obtusae. Perithecia atra, globosa, 160-200 μ diam.; cellulis parietis sub-conoideis. Asci bispori fugaces. Sporae cylindraceae, vix constrictae utrinque rotundatae, 35-43 × 10–13·5 μ; cellulis fere inaequalibus.

Hab. in foliis *Sapindi oblongifolii*, Durban, 11.7.11, leg. Doidge [1572].

Meliola Indigoferae Syd. nov. spec.

Plagulae plerumque hypophyllae orbiculares v. irregulares, 1-4 mm. diam. saepe confluentes et tunc totam fere paginam folii occupantes. Mycelium ex hyphis undulatis, brunneis, opposite ramosis, septatis (articulis 25-30 μ longis) 5-7 μ crassis compositum. Hyphopodia capitata opposita, alternantia v. unilateralia, 14-16 μ longa et 7–10 μ lata; cellula basali breviter cylindracea; apicali ovoidea v. globulosa. Hyphopodia mucronata inter hyphopodia capitata interspersa, opposita, tenue ampullacea, 12-15 μ longa. Setae myceliales sat numerosae, curvato-acclivae v. geniculatae, pellucide brunneae 150–300 μ longae, basi 6–10 μ crassae, sursum pallidiores et sensim attenuatae, apice acutae. Perithecia in centro plagularum laxe gregaria, atra, globosa ad verticem applanata, 150–220 μ diam.; cellulis parietis leniter convexis. Asci bispori. Sporae 4-septatae, cylindraceae, rectae v. leniter curvatae, vix constrictae, utrinque rotundatae et attenuatae, 30-38 × 12–15 μ, non-nullae usque 42 μ longae.

Hab. in foliis *Indigoferae natalensis*, Buccleuch, Natal, 17.7.18, leg. Doidge [11559].

Meliola littoralis Syd. nov. spec.

Plagulae amphigenae, plerumque epiphyllae, atrae, tenues, sub-orbiculares 2–5 mm. diam. vel confluendo majores et irregulares. Mycelium aracnoideum ex hyphis brunneis rectiusculis v. plus minus undulatis, septatis (articulis 20-40 μ longis) opposite ramosis, 7-8 μ crassis compositum. Hyphopodia capitata alternantia v. unilateralia, 23-30 μ longae, cellula basali breviter cylindracea v. cylindracco-conoidea, 7–10 μ longa, apicali ovoidea v. sub-cylindracea 10-12 μ lata. Hyphopodia mucronata numerosa, conspicua, opposita alternantia v. unilateralia, ampullacea collo brevi, 13-16 μ longa. Setae myceliales sat numerosae sparsae, 300-640 μ longae, basi atrae opacae et 8-10 μ crassae, sursum ad apicem pellucidum obtusum sensim attenuatae. Perithecia sparsa sat numerosa, atra globosa, 190-240 μ diam. cellulis parietis convexis. Asci ellipsoidei, 2-4-spori. Sporae brunneae, 4-septatae, cylindraceae, leniter constrictae, utrinque late rotundatae 40–45 × 17–20 μ.

Hab. in follis *Plectroniae* sp. Knysna, 13.5.23, leg. Doidge [17196].

Meliola Osyridis Doidge nov. spec.

Plagulae amphigenae sed plerumque hypophyllae, atrae, orbiculares usque 3 mm. diam. saepe confluendo majores, irregulares. Mycelium ex hyphis brunneis, rectiusculis v. leniter undulatis, septatis (articulis 10-20 μ longis) opposite ramosis, 6-8 μ crassis compositum. Hyphopodia capitata alternantia v. unilateralia, 20-30 μ longa, cellula basali breviter cylindracco-conoidea, apicali ovata v. cylindracea, 7-10 μ lata. Hyphopodia mucronata sat numerosa, opposita, ampullacea 15-17 μ longa et basi 6-10 μ lata, collo brevi crassiusculo curvato. Setae myceliales sat numerosae, simplices, rectae v. leniter flexuosae, 240-340 μ longae, basi opacae et 7-8 μ crassae, sursum ad apicem obtusum sub-pellucidum sensim attenuatae. Perithecia in centro plagularum gregaria atra globosa minute verrucosa 200-250 μ diam. cellulis parieties convexis v. conoideis. Asci bispori fugaces. Sporae cylindraceae brunneae 4-septatae vix constrictae utrinque rotundatae 43-47 × 17-20 μ.

Hab. in foliis *Osyridis compressae*, Grahamstown, 15.11.17, leg. Doidge [10954].

Meliola rhoina Doidge nov. spec.

Plagulae amphigenae, atrae, velutinae 1-3 mm. diam. haud raro confluentes tunc partem plus minus magnam folii occupantes. Mycelium ex hyphis reticulatis brunneis,

plus minus undulatis, rarius subtorulosis, septatis (articulis 17–30 μ longis) alterne v. irregulariter ramosis, 7–10 μ crassis compositum. Hyphopodia capitata alternantia, recta v. curvata, 18–33 μ longa, cellula basali breviter cylindracea vel cylindraceo-conoidea, 6–10 μ longa; cellula apicali plus minus ovata fere semper plus minus irregulari saepe sub-lobata 10–15 μ lata, a rotundata v. truncata. Hyphopodia mucronata haud numerosa, praecipue in centro plagularum evoluta, opposita, pallidiora, ampullacea collo tenui 18–22 × 8–10 μ. Setae myceliales sat numerosae sparsae, erectae, 280–400 μ longae, basi opacae, 7–9 μ crassae, sursum haud vel vix attenuatae apice sub-pellucidae acutae (apice rarissime bifurcatae). Perithecia sparsa v. subgregaria, atra, globosa, 180–240 μ diam., cellulis parietis leniter convexis. Asci ellipsoidei v. ovati, breviter pedicellati, 2-4-spori. Sporae 4-septatae, cylindraceae utrinque late rotundatae, leniter constrictae 43–50 × 16–18 μ.

Hab. in foliis *Rhois longispinae*, Despatch prope Uitenhage, Cape Province, 24.3.11, leg. Doidge [1239].

Meliola Scolopiae Doidge nov. spec.

Plagulae amphigenae, aterrimae, velutinae irregulariter sparsae, plus minus orbiculares, usque 5 mm. diam., saepe confluentes. Mycelium ex hyphis dense et irregulariter reticulato, ramosis, rectis vel undulatis, 6–7 μ crassis compositum. Hyphopodia capitata numerosa, alternantia vel unilateralia, recta vel curvata, 23–27 μ longa, cellula basali 6–13 μ longa, et 6–7 μ lata, cylindraceo-conoidea vel gibbosa; cellula apicali plus minus clavata, ambitu irregulariter 2–5 angulata, 10–18 μ lata, lobulis 2–5 humilibus late rotundatis vel truncatis praedita. Hyphopodia mucronata haud numerosa, inter hyphopodia capitata interspersa, praecipue in centro plagularum evoluta, opposita v. unilateralia plus minus lageniformia, continua, 20–24 μ longa, e basi ventricoso-dilatata 6–6·5 μ lata subito in collum rectum vel curvatum 3 μ crassum attenuata. Setae myceliales copiosae, erectae rectae vel leniter curvatae simplices, opace atro-brunneae, 300–400 μ longae, ad basim 7–10 μ crassae, apicem versus leniter attenuatae, ad apicem acutae. Perithecia laxe gregaria, atra, globosa, 200–300 μ diam., in sicco collapsa, cellulis parietis protruberantibus convexis, 12–16 μ diam. Asci 2–3-spori, fugaces. Sporae atro-brunneae, 3-septatae, ellipsoideae, utrinque rotundatae, plus minusve constrictae, 53–57 × 16·5–20 μ.

Hab. in foliis *Scolopiae Zeyheri* Pirie, prope Kingwilliamstown, 18.7.27, leg. Doidge [22421].

HOST INDEX BY FAMILIES

The family numbers are taken from the "Genera Siphonogamarum" of Della Torre and Harms.

5. On Taxaceae — Irene Podocarpi; Meliola peltata; Meliola Panici.
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21. On Palmae — Meliola Behniae.
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91. On Ranunculaceae — Meliola Popowiae.
98. On Anonaceae — Meliola rigida.
101. On Monimiaceae — Meliola Cryptocaryae; Meliola dactylipoda.
102. On Lauraceae — Meliola Bosciae.
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117. On Saxifragaceae — Meliola polytricha.
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147.	On Euphorbiaceae	Meliola Cluytiae. Meliola Excoecariae.
149.	On Buxaceae	Meliola buxicola
153.	On Anacardiaceae	Meliola brach[illegible] Meliola Loxostyla Meliola rhoina.
158.	On Celastraceae	Irene speciosa. Irene gloriosa. Irene ditricha. Meliola Evansii.
162.	On Icacinaceae	Meliola comata. Meliola campylotricha. Meliola cladophila.
165.	On Sapindaceae	Meliola Allophylli. Meliola capensis. Meliola Doidgeae. Meliola furcillata.
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247.	On Apocynaceae	Irene Strophanthi. Meliola Carissae. Meliola Goniomae.
254.	On Labiatae	Meliola Psychotriae.
257.	On Scrophulariaceae	Irene Peglerae.
266.	On Acanthaceae	Meliola Psychotriae.
270.	On Rubiaceae	Irene glabra. Meliola littoralis. Meliola Psychotriae. Meliola woodiana.

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(arranged alphabetically).

Allophyllus	Meliola Allophylli. Meliola furcillata.
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Baphia	Meliola Indigoferae.
Barleria	Meliola Psychotriae.
Barosma	Meliola microthecia.
Behnia	Meliola Behniae.
Bowkeria	Irene Peglerae.
Buddleia	Irene inermis.
Burchellia	Meliola littoralis.

Buxus	Meliola buxicola.
Capparis	Meliola Bosciae.
Carissa	Meliola Carissae.
Cassine	Meliola Evansii.
Celastrus	Irene gloriosa.
	Irene ditricha.
[illegible]anthus	Irene implicata.
	Irene inermis.
[illegible]ylis	Meliola Choristylidis.
Cladium	Meliola argentina.
Cliffortia	Irene calostroma.
Cluytia	Meliola Cluytiae.
Cnestis	Meliola Cnestidis.
Cryptocarya	Meliola Cryptocaryae.
	Meliola dactylipoda.
Curtisea	Meliola ganglifera.
Cussonia	Meliola leptidea.
Doryalis	Irene natalensis.
Eugenia	Irene atra.
	Irene Zeyheri.
	Meliola cylindripoda.
	Meliolina cladotricha.
Fagara	Meliola Toddaliae.
Galopina	Meliola Psychotriae.
Gardenia	Meliola littoralis.
Gonioma	Meliola Goniomae.
Grumilea	Meliola littoralis.
Gymnosporia	Irene speciosa.
	Meliola Evansii.
Halleria	Irene Peglerae.
Hippobromus	Meliola capensis.
Hypoestes	Meliola Psychotriae.
Indigofera	Meliola Indigoferae.
Isoglossa	Meliola Psychotriae.
Jasminum	Meliola gemellipoda.
Keetia	Meliola littoralis.
Knowltonia	Meliola Knowltoniae.
Kraussia	Irene glabra.
Leucosidea	Irene calostroma.
Loxostylis	Meliola Loxostylidis.
Maerua	Meliola Bosciae.
Myrsine	Meliola transvaalensis.
Niebuhria	Meliola Bosciae.
Nuxia	Irene Nuxiae.
Ochna	Meliola Ochnae.
Olea	Meliola oleicola.
	Meliola petiolaris.
Oncoba	Meliola clavieulata.
Osyridicarpus	Meliola bifida.
Osyris	Meliola Osyridis.
Pavetta	Irene glabra.
	Meliola littoralis.
Peddiea	Irene Peddieae.
Phoenix	Meliola palmicola.
Piper	Amazonia asterinoides.
Pittosporum	Meliola polytricha.
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Plectronia	Meliola littoralis.
	Meliola woodiana.
Pleurostylia	Irene ditricha.
Podocarpus	Irene Podocarpi.
	Meliola peltata.
Popowia	Meliola Popowiae.
Pteroclastrus	Meliola Evansii.
Pygeum	Irene calostroma.
Pyrenacantha	Meliola comata.
Rhinacanthus	Meliola Psychotriae.
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Rhoicissus	Meliola Merillii.

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	Meliola rhoina.
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——————————— :o: ———————————

SOUTH AFRICAN RUST FUNGI II

By E. M. Doidge.

Since the publication of the "Preliminary Study of the South African Rust Fungi" (Bothalia II, Part 1A), several species have been found which have not previously been recorded from South Africa. These are mostly from the Pretoria district, and were collected in connection with the botanical survey of this area which is now in progress.

Uromyces Strauchii sp. nov.

Aecidia hypophylla solitaria vel in greges parvos usque 2 mm. diam. densiuscule disposita, flavidula, immersa, cupulata, 300–350 μ diam. margine incisa; cellulae peridii rhomboideae v. oblongae, 20–37 × 15–18 μ, pariete exteriore 5–6 μ crasso striato, interiore 3–3·5 μ crasso verrucoso. Sporae sub-globosae, 23–27 μ diam. membrana hyalina tenue verruculosa, 1–1·5 μ crasso.

Teleuto-sori hypophylli, sparsi, minuti, rotundati v. elliptici, 0·5–1 mm. diam. pulverulenti, atro-brunnei, epidermide disrupta cincti. Teleutosporae ellipsoideae vel ovatae, rarius sub-globosae, castaneo-brunneae 17–30 × 15–21 μ, apice rotundatae, basi rotundatae v. sub-attenuatae; episporio 1·5–2 μ crasso, ad apicem haud incrassato, subtiliter, confertim flexuoseque caniculato; pedicello breve, hyalino, persistente.

Hab. in foliis *Cluytiae daphnoides*, Alexandria, July 1928, leg. Doidge [22370].

The marking of the epispore is rather similar to that of the teleutospores of *Puccinia cephalandrae*. It is marked with very fine and closely set, tortuous grooves, the corresponding ridges being bent and flexuous, and not oriented in any one direction.

This species is quite distinct from *U. Cluytiae* K. and Cke.

Puccinia pentactina sp. nov.

Uredo-sori hypophylli, minuti, brunnei, epidermide disrupta cincti. Uredosporae ovatae v. globosae, 30–38 × 25–27 μ; episporio hyalino, 1·5 μ crasso, minute echinulato, poris germinationis 2, equatorialibus praedito.

Teleutosori hypophylli, sparsi, atri, rotundati, pulverulenti, 0·5–1 mm. diam. epidermide disrupta cincti. Teleutosporae ovatae, oblongae v. late ellipsoideae, ad apicem rotundatae, ad basim rotundatae vel attenuatae, medio vix constrictae, 40–60 × 26–33 μ; episporio 3–3·5 μ crasso, apice haud incrassato, minute remoteque verrucoso; pedicello crasso, hyalino, persistente, 6–7 μ crasso et usque 120 μ longo, nonnunquam oblique inserto.

Hab. in foliis *Senecionis pentactini* Klatt., Garstfontein, Pretoria, 10.6.28, Leg. Mogg [23418].

The germ pores of the teleutospore are rather conspicuous, papillate; the germ pore in the upper cell is rarely apical; it is usually one-third to one-half of the distance between apex and septum, and the pore in the lower cell is placed in a similar position between septum and base. Only a few scattered mesospores were seen, and these were similar in character to the teleutospores.

Puccinia cyperi-fastigiati sp. nov.

Uredo-sori brunnei, hypophylli, sparsi, minuti, elliptici v. confluendo lineares, epidermide disrupta cincti. Uredosporae ovatae, ellipsoideae v. sub-globosae, 30–37 × 21·5–27 μ, episporio flavido-brunneo, 2·5–3 μ crasso, modice echinulato, ad apicem haud incrassato, poris germinationis 3 (rarissime 2 v. 4) equatorialibus praedito.

Teleutosori hypophylli, conformes. Teleutosporae ellipsoideae v. oblongae, rarius sub-clavatae, ad apicem late rotundatae rarius sub-acutae; ad basim rotundatae rarius plus minus attenuatae, medio leniter constrictae, 33–43 × 18·5–24 μ, rare usque 30 μ latae: episporio leve, circ. 1·5 μ crasso, ad apicem leniter incrassatae (usque 5 μ), poro germinationis cellulae superioris apicale, inferioris obscure; pedicello persistente, sub-hyalino, apice 6–8 μ crasso, usque 60 μ longo.

Hab. in foliis *Cyperi fastigiati*, Silverton Ridge, Pretoria, 12.6.28, leg. Kresfelder [23415].

Puccinia Imperatae, sp. nov.

Teleuto-sori amphigeni, sparsi v. plus minus striati, oblongi v. sub-lineares, 0·3–3 mm. longi, atri, sub-pulverulenti, epidermide disrupta cincti. Teleutosporae flavido-brunneae, ellipsoideae v. ovatae, ad apicem rotundatae v. subacutae, ad basim rotundatae v. attenuatae, medio haud vel vix constrictae, 40–50 × 20–27 μ; episporio leve, 3–3·5 μ crasso, ad apicem valde incrassato (7–10 μ), poro germinationis cellula superiore plerumque apicale, inferioris ad septum posito; pedicello crasso, hyalino v. apice brunneolo, persistente, 6–7 μ crasso, usque 120 μ longo, nonnunquam oblique inserto.

Hab. in foliis *Imperatae cylindricae* Beauv. var. *Thunbergii* Hack. Skinner's Court, Pretoria, 23.5.28, leg. Doidge [23416].

Associated with *P. rufipes*, sometimes occurring on the same leaves; the teleuto-sori are readily distinguishable from those of *P. rufipes*, being black and much more conspicuous. The teleutospores differ in size and in the epispore, which is thicker and more strongly thickened at the apex.

Puccinia tosta Arthur.

Bull. Torr. Bot. Club XXIX, p. 228 (1902).

On leaves of *Sporobolus fimbriatus*, Fountains Valley, Pretoria, 4.5.28, Doidge [23343].

This species has only been recorded previously from North America, but the sori and teleutospores on *Sporobolus fimbriatus* appear to be identical with those of authentic material of *P. tosta* from the United States.

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1932

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